ADDIS ABABA UNIVERSITY

COLLEGE OF NATURAL AND COMPUTATIONAL SCIENCES

SCHOOL OF INFORMATION SCIENCE

ADOPTION OF INFORMATION AND COMMUNICATION TECHNOLOGY IN PUBLIC ADMINISTRATION IN OROMIA REGION: THE CASE OF BEREH AND SENDAFA WOREDAS

BY

GIRMA ASEFA

JUNE, 2017

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A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF ADDIS ABABA UNIVERSITY IN PARTIAL FULFILLMENT FOR THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN INFORMATION SCIENCE.

BY: GIRMA ASEFA

ADVISOR: LEMMA LESSA (PhD)

JUNE, 2017

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GIRMA ASEFA

Name and signature of Members of the Examining Board

Name	**Title**	**Signature**	**Date**
Lemma Lessa (PhD)	Advisor	_____	_____
_____	Examiner	_____	_____
_____	Examiner	_____	_____

Declaration

This thesis has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree in any university.

This thesis is the result of my own investigations, except where otherwise stated. Other sources are acknowledged by citations giving explicit references. A list of references is appended.

Signature: _____

Girma Asefa

This thesis has been submitted for examination with my approval as university advisor.

Advisor's Signature: _____

Lemma Lessa (PhD)

DEDICATION

TO MY FATHER!

Acknowledgments

First and foremost, my special thanks and heartfelt gratitude go to my advisor, Dr. Lemma Lessa for his unreserved and invaluable guidance and support he has provided me from the beginning to the end of the study, without which the completion of this work would have been unthinkable.

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Girma Asefa

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Abstract

Information Communication Technology (ICT) has become a significant tool to facilitate human activity that has made contributing to the countries' on economy and social welfare. As extant literature reveal, the application of ICTs in the public administrations is basically affected by the organizations context, technological context and environmental context factors. Purpose of this study was to identify the challenges and contextual factors that drive information and communication technology adoption in Bereh and Sendafa Woredas public administrations.

To achieve objective a qualitative and quantitative approaches were conducted with a survey that focused on ICT uses, its challenges and contextual factor that drive ICT in the public administrations. The quantitative survey study was conducted on 230 respondents on both Woredas and the qualitative key informant interview.

The data from both sources were combined and analyzed to get a view of the current situation. The findings show that the public administrations are mainly hindered by a group of challenges related to strategy design on ICT tools challenges for instances infrastructural, standard Internet connectivity design issues and the forces that drive the ICT adoption also ICT awareness creation among the top managers. Possible actions for management intervention are also forwarded based on the key findings.

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List of Acronym

AAU	Addis Ababa University
CDROM	Compact Disk Read Only Memory
DBMS	Data Base Management System
DSL	Digital Subscriber Line
ICT	Information and Communication Technology
IT	Information Technology
IP	Internet Protocol
IS	Information System
ISP	Internet Service Provider
LAN	Local Area Network
MAN	Metropolitan Area Network
MBPS	Megabyte per a Second
N.D	No Date
NICTPS	National ICT Planning and Strategies
NOS	Network Operating System
OICTDA	Oromia ICT Development Agency
VSAT	Very Small Aperture Terminal

CHAPTER ONE
INTRODUCTION

This chapter focuses on discussing the overall background of ICT, ICT in administrations, statements of the problem, objectives, and scope of the research. It targets to create a common platform for understanding the research.

1.1. Background of the study

Public organizations have administrative subdivision of power ranked as federal, region, zone, woreda and Kebeles for the aim to increasing good governance to provide the sustainable development of within their countries. The main problem which were being challenges of many organizations are to diversify their occupational risk and , inadequate to make short term planning and decision as well as lack of sufficient information for their strategies planning, so that they obliges to make short-term decisions through using adopting Information and communication technology (ICT) in their work area (Ntwoku-Tchuinkep Habit , 2010).

The 20th century mankind made transform from agricultural and industrial age to knowledge and information societies based age and make the entity of governances wandering to ideas, design and ICT based management. This shift is making a game changer for the countries managements, due to access and share information from different administrative organizations (Lorange, 2002). This new technology age known as ICT age used to connect different area of the organizations such as, villages and community access points, scientific and research centers, all local and federal governments when central government sections establish websites and e-mail addresses. It is also agreed that nations would operate within their economic strengths as they attend to these action plans for the reason that they wish to bring a global information society.

Throughout the advancement of ICT, different organizational were networking to increasing cooperation among the networked within and out of the organizational boundaries, so that they uses it as a complementary tools toward a solution to address the organization challenges and need to solve and addresses the organization problem. As Seada (2015) explained, ICT is not solution or it was not creating a change by itself however it enhances the change and new

production that can address every problem of a society and organizations. So, most development experts accept that ICT can assist as tools of facilitator of transformation in developing nation. The adoptability of various technologies services used for reduction of operational cost, efficiency of professional processes, ease of structuring quality of citizens service, productivity of employee's motivation and development of staff, and getting the inexpensive advantage throughout the ICT influence on flexibility values (Mengistu, 2016).

The idea of technology adoption is relating with ideas of technology transmission process by which an innovated technology was communicated through certain channels over time among the members of a social system within the organizations, whereas adoption is a mental process which is relatively speed up with an innovation is accept by members of a social system and used in the area of their performances. It is mandatory to identifying the technology adoption challenges and factors that drives technology among the organizations.

To do things better the government of Ethiopia has recognized the power of ICT in national development plan. For this achievement the governments were ratification national ICT policy, new intuitional setup and organizational structure at regional and federal level by allocating sufficient resource for ICT development objective of updated improvement, to provide accurate information on governmental service through the voice to save employees and citizen's time and money for searching information (Debretsion, 2012).

In side of country polices oromia regional state, accept information and communication technology has been identified as one of the columns that will help public administrations to achieve its scheduled development goal. Some part of oromia regional state, oromia special zone administrative systems of Bereh and Sendafa Woredas still faces the problem of to achieve the development goal, short term planning ,management's staff, financing and delay reporting and inadequate integration between sectors and access the administrative information's with in a time this may be ICT implementation problem.

1.2 .Statement of the problem

The global information technology report was released at a time when many economies around the world are struggling to ensure that economic growth is equitable and provides benefits for their entire population's connections. These connections provide more data for better decision-making and improve the way governments, businesses, and individuals operate. This rapid growth of the field of ICT continuously changed the general face of the world. It is the major factor which enters every movement of the world life and the organization(s) who did not accept this innovation difficult to go throughout the world (Soumitra, 2015).

According to Gheorghe et al (2010), ICT application can make as the organizations can be observed the global countries. This shifting focus from manufacturing to service economy caused appearance of great number of new trends, like making values in services is often possible with less human work.

Abdu (2010) described that ICT has become driving force in today's society strengthening national economies and supporting democratic processes throughout the world. Therefore, acceptance and uses of ICT technologies has become mandatory. Dynamic adoption of ICTs in the world economies and management is astoundingly high, and is thought to cause huge changes in overall country`s economic performance and management. This is mainly due to ICT has unique features that change the way of doing, open new possibilities for setting up a performances, or just enhance increases in human and social capital. At the same, it can be adopted fast and at low cost, requiring minimal capabilities for their usage (Eli, 2014).

ICT is not mature in Ethiopia at the present when compare to other developed countries. Due to infrastructure and low level of Internet services penetration, lack of organized data and information resources and poor accessibility, lack of skilled human resources coupled with low ICT literacy and under developed private sectors. To solve these problems government of Ethiopia have designed ICT police which gave urgencies for its adoption among different organizations to address these problems (NICTPS, 2009).

In line with country ICT policy, oromia regional state draft regional ICT policy which is executed under oromia information and communication development agency. As a result, the agency has intended to perform many things to enhance ICT in the region at the level of

zone, Woreda, and Kebeles. The main duties of the agency to increase the rural connectivity and center of information to provide significant information to local community. ICT encourages in any sector such as in administration, education, agriculture, and health. In addition, development of human resource through training and research is another focus of regional state ICT police (Taffesse, 2012).

Also in line with the regional state ICT development agency, there is ICT program at Woredas level which is implemented under Woredas civil services and good governance office objectively to make easy the learning situation and sharing of good practices, reduce cost and save time of productivity. Furthermore, this program enhances productivity and advertises opportunity. Moreover, ICT sector at Woredas level provide video conferences, online education and training, computer maintenances, e-mail services, computer training, and Internet service, to the Woredas offices and communities (OICTDA, 2011).

Without considering the success of the ICT program, still there were problems to implementations of ICT public administrations because, it is weak when evaluated with its intended objectives and goals. Reports of the oromia ICT development agency show that, the woredas are far from the plan and there is a long way to achieve the target. There is ineffective quality and less efficient services provided by the region (OICTDA, 2011).

The researcher reviewed a lot of previous literatures those are focused on the adoption of ICT in public and privacy organizations, for instances on banks (Meseret, 2010), (Ayana, 2014) and (Bisrat, 2015) and (Yalew, 2015), Transport industry (Sinatayehu, 2014), Textile and Leather industry (Kumlachew, 2015), Ohemeng (2013) the adoption of ICT in the education public sectors and small and medium enterprise industry (Mangestu, 2016). But, as per the researcher believe there is no intent was made to describe ICT utilization status at the study area and in the Oromia public administrations system nevertheless the pervious related researches were done focusing on selected sector in public administrations . This indicated that there is a knowledge gap in issues there by huge investment on ICT is made without concrete and comprehensive evidence. As Maria and Tiago (2011) explained, ICT is universally regarded as an essential tool in enhancing the good governances and economies for both developed and developing countries of a World. These effects will only be realized if, and when, ICT are widely spread and used accurately accepted by the end user in their work place.

1.3. Basic Research Questions

In view of all of the above statements of the problem, the researcher tries to give answers for the following research questions:-

1. What are the challenges of ICT adoption in Bereh and Sendafa Woreda Administrations?
2. What are the employees opinion regarding, factors that drive ICT adoptions in Bereh and Sendafa Woredas Administrations?
3. What are the influences or impact of ICT adoption in Bereh and Sendafa woredas public administrations?

1.4. Objectives of the study

1.4.1. General objective

The general objective of this study is to identify the ICT adoption challenges and contextual factors that drive Information and communication technology in Bereh and Sendafa Woredas public administration and suggest possible solution to address their challenges.

1.4.2. Specific Objectives

Based on the general objective, the study tries to address the following main Specifics Objectives: -

- To examine the ICT skill and knowledge of the employees in Bereh and Sendafa woredas
- To identify the most challenges hold back in ICT adoption on the Bereh and Sendafa Woredas administrations.
- To know the employees opinion on the, factors that drive ICT adoption in Bereh and Sendafa Woredas public administrations.
- To examine the ICT influences or impact on the study area sectors public administrations.

1.5. Significance of the Research

This study is important in identifying challenges that hinder the ICT adoption, factors that drive ICT adoption and the impact of ICT on Woredas public administrations.

The benefits of this study are:

- Gives the workable of ICT adoption to the Bereh and Sendafa Woredas public administrations.
- Gives evidence to the organizations how to implement ICT in different sectors.
- Provides ways of ICT adoption and enable to good governances.

The findings in this study can be used to develop a standard for similar ICT use studies targeting Woredas communities. The results of the study may enable to provide the lowest level of Woredas with accurate and timely knowledge and information, to bridge the digital divide between Woredas, Organizations, to build organizational capacity at all levels of governances.

1.6. Scope of the Study

ICT has many components for the organization, but this research focuses only on factors that drive adoption of ICT and challenges that hinder the adoption of ICT in the governmental organizations those are found in the thirty five (35) sectors of both selected Woredas of special zone surround of Finfinne, Oromia. Other types of ICT such as outsourcing, cloud computing, artificial intelligence enabled decision support systems is not considered or planned in the research.

1.7. Definition of Significant Terms

Woreda: It is an administrative division of federal power, management local government.

Adoption: It is a process of taking up or starting to use or following.

Factors: Elements contributing to a particular result or situation

Challenges: A New or difficult task that tests some body ability and skill

Influences: The effect that somebody or something has on the way a Person thinks or behaves or on the way that something's works

Public administrations: An administration as, tools through which the fundamental objectives of the organizations may be more optimize efficiently and effectiveness when allocating human and material resources as well as to make the best use of existing resources and best world practice.

1.8. Organization of the Study

This study is divided into five chapters. Chapter one describes the background, statement of problem, objectives of the study, research question, expected benefits of the study, scope and limitation of the study, and organization of the study. Chapter two told about the review of the relative literatures which leads to the development of conceptual framework. Chapter three specifies the data and method of the study. Sources of data and variables narrated in this part. Methods of data analysis are also described in this chapter. Whereas, Chapter four discuss on the results and analysis followed by conclusions, recommendations, and suggestions for further study in Chapter five.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

The objective of this study is to examine factors that affect adoption of ICT by employees in a government organization in an economically developing country in Ethiopia in oromia and to identified challenges that hinder the organizations to implement the new technology ICT. To achieve this objective the researcher reviewed literature in two areas: (1) research on public administrations and (2) research on technology adoption in governmental organizations in different parts of the world.

2.2. Oromia Regions state

According Electronic information [(2)] and some written document told, Oromia (spelled Oromiyaa) in the Oromo language is one of the nine ethnically based regional states of Ethiopia, covering 284,538 square kilometers. It is bordered by the Somali Region to the east; the Amhara Region, the Afar Region and the Benishangul-Gumuz Region to the north; South Sudan, Gambela Region, and Southern Nations, Nationalities, and Peoples' Region to the west; and Kenya to the south. The 2007 census reported Oromia Region population is 26,993,933; making it the largest state in population and area.

Oromia includes the former Arsi Province along with portions of the former Bale, Hararghe, Illubabor, Kaffa, Shewa, Sidamo, and Welega provinces. Important cities and towns included in Oromia are: Finfinne, Adama, Ambo, Asella, Bishoftu, Chiro, Dembidolo, Fiche, Gimbi, Robe, Goba, Dello Buna, Jimma, Metu, Negele Boran, Moyale, Nekemte, Shashamane, Haramaaya and Waliso.

The Oromia Region was inhabited by non-Oromo ethnic communities for centuries. The earliest people to live in Oromia Region were the Muslim Gurage people from southern Ethiopia, under the kingdom of Sultanate of Showa. The Sultanate of Ifat, Adal Sultanate, Sultanate of Showa, Kingdom of Damot, Kingdom of Ennarea, Ganz province, Sultanate of Bale, Maya, Hadiya Sultanate, Sultanate of Dawaro, Fatagar, Gumar, Gidim, Werjih, Gurage,

Gafat were some of the kingdoms and peoples in the area before the 16th century Oromo expansion. Most of these ancient Kingdoms situated in present-day Oromia Region were semi-autonomous provinces of Ethiopian Empire. After the brutal conquest of these region by the Oromo people, the indigenous inhabitants were reduced to Gabaros (serfs) and were Oromized through collective adoption process known as Gudifacha and Mogasa. The affiliated groups were given new genealogies and started counting their putative ancestors in the same way as their adoptive kinsmen. The native ancient names of the territories were replaced by the name of the Oromo clans who conquered it.

Before 2000, the regional capital of Oromia was Addis Ababa, also known as "Finfinne" (in the Oromo language). The relocation of the regional capital to Adama sparked considerable controversy, and this forced the government to bring back the capital to Addis Ababa. Critics of the move believed the Ethiopian government wished to de-emphasize Addis Ababa's location within Oromia. The other hand; the government maintained that Addis Ababa "has been found inconvenient from the point of view of developing the language, culture and history of the Oromo people."

On 10 June 2005, the Oromo People's Democratic Organization, part of the ruling coalition, officially announced plans to move the state capital back to Finfinne.

Oromia shares a boundary with almost every region of Ethiopia except for the Tigray Region. This boundary has been disputed with Oromia’s neighbors in a number of cases, most notably between Oromia and the Somali Region. One attempt to resolve the dispute between the two regions was the October 2004 referendum held in about 420 kebeles in 12 woredas across five zones of the Somali Region. According to the official results of the referendum, about 80% of the disputed areas have fallen under Oromia administration, though there were allegations of voting irregularities in many of them.The results led over the following weeks to minorities in these kebeles being pressured to leave. In Oromya, estimates based on figures given by local woreda and kebele authorities suggest that 21,520 people have been displaced in border woredas, namely Mieso, Doba, and Erer in the Mirab and Misraq Hararghe Zones. Federal authorities believe that this number may be overstated by as much as 11,000. There are also more than 2,500 displaced persons in Mieso.In

addition, there were reports of people being displaced in the border area of Moyale and Borena zones due to this conflict.

Based on the 2007 census conducted by the Central Statistical Agency of Ethiopia (CSA), Oromia Region has a total population of 26,993,933, consisting of 13,595,006 men and 13,398,927 women; urban inhabitants number 3,370,040 or 11.3% of the population. With an estimated area of 353,006.81 square kilometers, this region has an estimated population density of 76.93 people per square kilometer. For the entire region 5,590,530 households were counted, which results in an average for the region of 4.8 persons to a household, with urban households having on average 3.8 and rural households 5.0 people.

2.3. Description of the Study Area

As the recorded system documents and electronic site stated (2) and (3) of Oromia Special Zone Surrounding Finfinne is one of the zones of the oromia region in Ethiopia. It was established in 2008 from the former Burayu Special Zone and parts of North Shewa, East Shewa, Southwest Shewa and West Shewa Zones. This zone is surrounding the capital of Ethiopia, Addis Ababa, which is called Finfinne in the Oromo language. The main reason for creating this special zone was to simplicity the co-operation and development of surrounding areas of Addis Ababa and to control the urban extension of this city on the lands of oromia.

The administrative center of this zone is in Addis Ababa. Bereh woreda is one of the Woredas in the oromia special zone surround finfinne region of Ethiopia by having the 22 kebeles. Administrations and the total population of this woreda is female 41668 and male 42025 and the total 83725 population is found in this woreda. It was part of farmer Woredas which was separated for Bereh Woredas administration and Sendafa Town administration.

Sendafa is a town and separate woreda in central Ethiopia which is rounded by Bereh Woreda kebeles. This woreda have 3 kebeles. Its name is taken from the Oromo name for a kind of thick, jointed grass or reed which grows in swampy areas. Located in the Oromia Special Zone Surrounding Finfinne of the Oromia Region, The town lies on the paved Addis Ababa- Adigrat highway, some 38 kilometers north of the capital. The 2017 national census reported a total population for Sendafa around 12,298, of whom 6,373 were men and 5,925 were women.

2.4. Public Administrations

Administration is a cooperative effort of a group of people to achieve specific objectives of the communities within the country, their main aim were to achieve the aims of the general objective of public administration. The objective was related to the activities of government. AS Mbah (2007) puts it, public administration sector consists of establishments of Federal, State and local Government agencies that administer, oversee, and manage public programmers and have executive, legislative or judicial authority within a given area.

According to Surbhin (2016) explain the unique natures of public administrations as noted as.

- Public administration typically have more concerns and issues, their goals are usually more complex and ambiguous .Public sector agencies typically have vague , hard to measure ,multiple ,and even conflicting goals with which they must contend. This is usually a product of lack of profit indicators and incentives for the public sector due to political oversight and multiple interests that needs to authorize programs.
- Public sector agencies typically have more formalization such as excess rules and procedures that needs to be enforced. Public agencies, therefore, are usually associated with an excessive amount of rules that may impede its performances.
- Public agencies have more formalized personnel procedures ,purchases processes and others administrates task that are regulated by central administrative agencies .there is typically more external oversight of public agencies for personnel and purchasing decisions.
- Public ownership of sources of founding reflects a degree of control, and public agencies have a greater degree of institutional control.

2.5. Adoption

The term adoption was first introduce by the Roger (1995) based on the fact in which innovation such as idea, product, technology, or program that is a mental activity through in which an individual or group(s) passes from hearing about an innovation to final acceptances through certain channel over time among the members.

Roger (1995) has categorized the steps in which users take to adopt an innovation:- knowledge, persuasion, decision, implementation, and confirmation. Users in the same social

framework, through a series of communication channels and over a period of time would pass through these steps. Though rejection of innovation could happen at any of the stages, the decision stage is where users are supposed to choose rejection or acceptance of the innovation.

Knowledge: The knowledge stage is characterized by the lack of sufficient information by the user while awareness about the innovation is apparent. In addition, users are not motivated enough to dig deeper and know more about the innovation.

Persuasion: Persuasion shows the information seeking behavior of users, which is manifested in the need to know more about the innovation. This is where interest about the technology starts to build up among users.

Decision: After users are well accustomed with the innovation, the decision about whether to accept or reject the innovation would be made after a thorough analysis of the advantage and disadvantage associated with the innovation. What makes the decision stage the most difficult for analysis and study is the individualistic nature of the drives that would affect the reject/accept decision.

Implementation: The implementation stage varies from individual to individual. It is finding more about the usefulness of the innovation and could involve learning more about it through time.

Confirmation: The confirmation stage could mean that users have decided to use the innovation or users are committed in using the innovation fully.

While each individual might pass through the adoption steps at some time, each one will have his or her own pace different from the other. There are essential characteristics of innovations that influence an individual's decision to adopt or reject an innovation. These characteristics include the relative advantage that compares the innovation with its predecessors for new features and improvements. Compatibility is the second characteristic; users would have to check if the innovation is compatible with the way they have been running their life and work environment. In addition to this complexity of the innovation, trainability; the ease of experimenting with it and observability; the extent that an innovation is visible to others are the major characteristics that affects the adoption of innovation (Olatokun and Igbinedion, 2009).

2.5.1. Process of Adoption

The diffusion of new technology in organization communities takes place through its adoption by individual or groups in the organizations. Adoption is a decision to make full use of new idea as the best world practice, but the decision to adopt a new idea, involves a process composed of learning, deciding, and acting over a period of time.

According to Tosan (2008), the adoption process, is a decision-making process which is go through a number of mental stages before making a final decision to adopt a new trend. Adopts a new idea is involves through the following five steps:

Awareness stage: this is the starting stage where in the communities in the organizations come to know the existence of the new idea but they do not have full information about the idea.

Interest stage: the organizations acquire more information about new idea by wanting to know what the idea is, how it works and what its potentialities.

Evaluation stage: at this stage an organization makes mental application of the new idea in the present and expected future situations.

Trial stage: the organizations may not take up any new idea and an innovation right away on a large scale because they do not want to take risk even though the potential of the idea has been proved. The new idea is applied on a small scale in order to determine its utility or feasibility and applicability in own situation of strategies.

Adoption stage: being satisfied with the performance of the new idea tested on small scale in his or her own situation, the organizations accept and use the new idea continuously on a full scale.

2.5.2. ICT adoption and use

The uptake of ICT in the organizations increases the people willingness and rationalized the organizations, this is happen when media or personnel contact each other make as the information flow among the organization causes the smooth performance as well as used to identify the organization activity and access new information from the internet**.**

ICT and use of the ICT in individual, government, business and financial organizations in the entire world have changed the face, but, in the developing countries, poor economies, lack of

education and infrastructure were among the challenges that contribute to the slowdown the adoption of technology by studying the number of reports and studies that are easily found in the internet (*Huda, et al,* n.d). As Mohd *et al* (2012) explained, ICT adoption increase the management effectiveness, improve the service, monitoring the process of communication with the workgroup internally and externally for their administration purpose. Manage the flow of the information and make as the organizations would be better to understanding about their organizations requirement.

The adoption of ICT is a crucial decision for growth, production, and building good governances, so that organizations who adopt IT innovations have to sustainable their economic position as well as to create organizations advantages (Arpaci *et al*, 2012).

2.6. Public administration and ICT

Many scholars assumed that the new media would reduce existing barriers to democratic participation and that internet would facilitate an era in which democratic debate would be able to develop quickly and be successful or common. In this series the researcher would try to understand the nature of a wide variety of innovations taking place in the public administration of the 21st century and try to evaluate their poor outcomes ICT is the study, design, development, application, implementations and support management information systems, particularly computer hardware and software. It deal with the use of computers and computers software to security convert, store, protect and toward the operational and strategic activity of public organizations (Laudon & Laudon, 2012). Public administrations and ICT deal with the use of ICT to shape the organizational changes and influenced every function of the public administrations with the organizational changes.

The direct human relation with government through telephone, common contact center at village and rural, World Wide Web and e-mail facilities will enhance efficiency of public sector and reduce opportunities for corruption. The integrations of within public administrations are broadly aimed at strengthening governance public administration capacities in developing countries to achieve national development objectives mission and vision. Capacity development of the countries achieved through the sharing of information, knowledge, innovations and best practices in public administration among countries,

predominant through knowledge networking (United State public Administrations Network and public administration knowledge space, n.d).

Experts around public Administrations, enables that as the ICT Section used to generate the timely up-to-date knowledge on trends, issues, innovations, and best practices of world in the area of governance systems known as public sectors of organizations wide-world and to link these with inter-governmental policy making among the countries.

According United State public Administrations Network and public administration knowledge space (n.d) explain, public administration Using ICT for four main purposes,

- To transform public administration organizations to be effective, efficient, transparent, accountable, innovative, and citizen-oriented in pursuit of development and delivery of public services.
- To develop public sector human resources capacities, including leadership, for effective, efficient, and responsive delivery of services, professional competence, ethical conduct and commitment to public service.
- To formulate strategies for strengthening organizational capacities for engaging citizens in governance, public administration and development management for responsive, transparent, and accountable delivery of services.
- To connect the potential of ICT for effective performance of governments. These involve the strengthening public administration capacity both at central and local levels and in all branches of government, including the executive, the legislative, and the judiciary.

The objectives is to providing advisory services on the design and application of ICT in governance and on public sector reforms (such as improved budgetary practices, regulation of revenue earning sectors, and change management for effective public service) with particular emphasis on least developed countries, countries with economies in transition. It also provides on-line training courses and materials such as on professionalizing the management of human resources in the public sectors; strengthening leadership capacities for local governance and poverty reduction; strengthening institutes responsible for public administration, education and training; citizen engagement in public administration and development management (United State public Administrations Network and Public administration knowledge space, n.d).

2.7. Factor that drive ICTs adoption

Today, ICT have tried to eradicate the work and fatigue associated with the handling and preparation of record countless times in order to get information for management decision on important administrative issues. The crucial purpose of this technology is to provide a quality services through made thing better and faster.

Some sectors technologist encounter certain factors that drives with the accepting and use of ICT technologies. Those factors of ICT adoption are common among public administrations in both the developed and developing countries. ICT contains information about occupational strategies, an organization context, the technology itself and its surrounding environment (Mengistu, 2016).

Three activities in an information system produce the information that organizations need to make decisions, control operations, analyze problems, and create new innovations or services. These activities are input, processing, and output. Input captures or collects raw data from within the organization or from its external environment. Processing converts this raw input into a meaningful form. Output transfers the processed information to the people who will use it or to the activities for which it will be used. Information systems also require feedback, which is output that is returned to appropriate members of the organization to help them evaluate or correct the input stage (Laudon& Laudon, 2012).

To fully understand information systems, the organizations must understand the broader organization, management, and information technology dimensions of systems and their power to provide solutions to challenges and problems in the organizations environment, this broader understanding of information systems, which encompasses an understanding of the management and organizational dimensions of systems as well as the technical dimensions of systems, as information systems literacy. Computer literacy, in contrast, focuses primarily on knowledge of information technology. Management of information system deals with behavioral issues as well as technical issues surrounding the development, use, and impact of information systems used by managers and employees in the organizations ((Laudon & Laudon 2012).

As Oliveira & Martins (2011) explained, adoption of innovations has also mostly focused on the factors that drive adoption, diffusion and innovations of new technology with within area

of performances. A different of factors may affect an organizations decision to adopt and implement a particular technology that is ICT technologies. These factors can be categorized under technology, organization and environment aspects of an organizational context.

There are four major categories in reviewing factors that drives ICT adoption. These are organizations strategies, organizational context, environmental and technological factors. The detail factors that drive ICT adoption would be discussed in the following four major classes.

2.7.1. Organizational strategies

The services in the organization are capable of providing to its citizens, and employees are a direct function of its ICT infrastructure. Ideally, this infrastructure should support the organizations and information systems strategy. New ICT have a powerful impact on organization strategies, as well as the services that can be provided to communities.

It is known that the power of new technological change to influence organizations structure and economical advantage, an organization's ICT strategy becomes an essential ingredient in its overall governing strategy and provide sustainable development meaning that the full access of ICT has been gone beyond the connectivity issues to embrace human, economics, social resources, institutional structure and government network which are the key development outcome.

The Organizations that have no know-how of technology, or with limited exposure and experience, tend not to be innovative or early adopters of a technology. As Minishi, et al (2005) explains that, organizations without prior technological experience or knowledge suffer from uncertainties caused by the possible introduction of new innovation in the organization. Furthermore, early adopters are different from late adopters in many ways; for example, (Rogers, 1995) showed that early adopters are mainly opinion leaders who influence others to adopt an innovation; they tend to have more years of formal education, they also participate socially outside their social group. In addition, they have access to various media and sources of information, where they obtain their knowledge about innovations. In general, early adopters have higher socioeconomic status than late adopters. In addition, early adopters tend to be less rigid and show greater rationality, have a favorable attitude towards change and science, and show an ability to cope with uncertainty and risk (Rogers, 2003).

According to information system design in Addis Ababa from 2009-2010 the ICT is used to support or shape the decision making process and redefine the organization strategies of an organizations and it is deploy either to driven down the organization cost or increase the citizens willingness to participate the communities(source: organization Information System Design –A.A. 2009-2010).

The secure, integrated approach of core organizations operations across the country using computer technologies for transmission and processing of occupational data internally and external, this types of services a stable is capable of providing to its citizens, and employees are a direct function of its ICT infrastructure. New ICT have a powerful impact on organizations strategies, as well as the services that can be provided to communities and the organizations that have no experience of technology, or with limited exposure and experience, tend not to be innovative or early adopters of a technology (Mengistu, 2016).

The Government of Ethiopia has made the development of ICT one of its strategic plan priorities. The recognized and currently enforce ICT policy is a demonstration of its commitment to the development of the country. The major indicators pointing to the low level of ICT development in Ethiopia are the absence of appropriate legal and regulatory frameworks, limitations in telecommunications infrastructure and low level of internet services penetration, lack of organized data and information resources, and poor accessibility, lack of skilled human resources coupled with low ICT literacy, under developed private sector. To control these constraints, the Ethiopia government, recognizing the importance of ICT development has endorsed ICT policy and strategy in 2009.

2.7.2. Organizational context

The organizational factors can be derived from internal and external pressures when adopting new technology. The sources of internal factors are mainly the characteristics of the organization, including the organization's mimetic characteristics, its work and technology experiences, and the most important factors are the organization's readiness, including available technological resources to adopt, and education background. Organizational culture also has important role on ICT adoption because it reflects the organizations administrative approaches and dominant culture. It is impacted by the background and management

approaches of the organizations founders. This expresses in the selection of ICT adoption, leader or follower and technology innovation.

Organizations have a structure that is composed of different levels and specialties. Their structures reveal a clear-cut division of labor authority and responsibility in organizations that are organized as a hierarchy, or a pyramid structure. The upper levels of the hierarchy consist of managerial, professional, and technical employees, whereas the lower levels consist of operational personnel. In an organization, the adoption of an innovation is mainly determined by the management, but the characteristics of workers such as work experiences and their education background influence the adoption of an innovation (Ohemeng, et al, 2013).

The organizations internal environment examines change from within the public sector organizations. This related with the management and the impacts on IT and public administrations, because of managers are critical for these organizations that affect as the organizations move and change them into the define direction. The successful ICT adoption in public organizations occurs when managers support the importance's of ICT to public organizations success (Jones & Bartlett, 2011).

According to Nyaiyo et al (2015) explained, the availability of funds, human attitude and related infrastructures as well as short term training are the most important factor that drives adoption of ICT.

2.7.2.1. Availability of funds on Adoption of ICT

The maintenance cost, the infrastructure cost such secure premises and electricity are high-priced as well as lack of financial resources to purchase hardware and software and lack of time for professional development and planning are the main factor that was influence the technology adoption among the public organizations (James n.d).

The cost of ICT training materials is considered to be among the problems that could negatively affect the implementation of ICT in most public services. The higher the cost of computers and their accessories, the fewer computers one can buy with the limited resources. Most organizations believe that the cost of ICT tools and equipment is high, discouraging investment in them and concludes that cost had a negative impact or leading to poor level on ICT adoption but ,the impact of ICT influences high for cost of production (Samuel, 2012).

2.7.2.2. Training and Adoption of ICT

Technological innovation has implications for employees of various institutions. Typically, public administrations are lacking in specialized ICT knowledge and technical skills. ICT training aiming to prepare the employees to integrate ICT effectively across the curriculum on ICT training application, both pre and in-service, can help employees who are tentative to move faster and adopt technology, while they show the more eager employees new ways in implementing ICT into their profession. Focused on improving employees ICT skills, including word-processing, spread-sheets, and surfing the internet shedding light on an issue that is of great interest to countries that adopt ICT to improve their employees performance for the information age (Atef, 2011).

2.7.2.3. Infrastructure on the Adoption of ICT

Despite the huge benefits of ICTs as a means of delivering quality public services, the potential of ICTs have not been fully connected by public administration especially in developing countries. This is due to problems of infrastructure access (slow or unreliable Internet connectivity). A good ICT infrastructure, therefore, is a situation for improving the well-being of organizations to adopt new technology and improve their performances.

According to peter(2014) explain that, the reliable and adequate Infrastructure make easy to access internet services , but the Practical challenges on those devices are the most hindrances one to access the internet services. Governments in developing nations need to work towards improving infrastructure including easy access to the internet information system and ICT applications and systems, among other occupational resources, so that the availability of infrastructure would be influences the adoption of new technology.

2.7.2.4. Employees attitude and adoption of ICT

Attitude is a pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way you perceive, think, and feel in relation to the problems.

Thus the impact of organizational culture is extensive and intense in organizations where it is manifested in concepts, such as the way we do things around here or certain rites and rituals of the organizations, the organization climate, the common practices and norms and core values (Nyaggah, 2015). Consistent information and effective communication are vital elements in public administration practice and the use of appropriate technologies can improve the quality and that make to reach on information and communication technology application.

According to Ahmed (2009) explain, individual cognition influence users' attitude (i.e motivation, resistance to change, acceptance of new ideas, fear of unknown, fear of losing job toward an ICT innovation), which are the essential to achieve good outcome for an organization. Change the attitude towards this new innovation of ICT is highly dependent on the knowledge that an individual possesses. Technology knowledge is needed to extracting the IT skill as the key element within the domain which found to be playing the most significant role in forming positive attitude towards ICT adoptions.

2.7.3. Environmental context

ICT is make contribution on the environmental sustainability through education, creating efficiency, and behavioral change as well as IT/IS reduce the number of staff required, but could also provide new skills to employees, increasing their employability (Tomlinson, 2010). The second is ICT's negative effect on the environment by causing degradation. This degradation occurs as a result of energy consumption, resource reduction and e-waste (Rattle, 2010).

As Wojciech (2009) explain that, when the organization went applied certain new technology they must be consider external impact with the environmental dimension. There is a wide range of government policies under environmental context that affect the efforts of organizations in any administrative to store ICT capabilities. As a result, it influences the ICT adoption of the organization these policies include political, social, and legal regulations. Public administration is influenced by the environment because of everything rounded by environment. Some of the factors that affect public administration that are affecting the technology adoption are social factor, human relations factor and language.

2.7.4. Technology Context

The development, application of computers and the increasing of internet accessibility have led to the state where users of public services will no longer have to go from desk to desk and ask for ask information, but they can get those through the portal of the competent authority on the internet. This is provided through the e-services in the area of e-government development and new tools, new rules, new economy, and more sophisticated users all this requires a completely new approach in public administration (Sead, et al, 2011).

ICT availability, today capabilities and future forecasting along with compatibility for addition are major technological factors that drive ICT adoption of organizations. Technologies that characterize one era may also be used in another time period for other purposes. The changes in IT infrastructure have resulted from developments in computer processing, memory chips, storage devices, telecommunications and networking hardware and software, and software design that have exponentially increased computing power while exponentially reducing costs (Laudon & Laudon, 2012).

2.8. ICT Adoption theories

The study is guided by the following theories; technology acceptance theory and Contingency Theory

2.8.1. Technology Acceptance theory

Technology acceptance theory was introduced by Davis (1989), is an adaptation of the theory of reasoned action specifically custom-made for modeling user acceptance of information systems. The goal of the theory is to provide a description of the elements of computer acceptance that is general, capable of clarifying user activities across a broad range of end-user computing technologies and user populations, while at the same time being both ungenerous and theoretically justified.

Bagozzi et al (1992) argue that users accept and use new technology based on two measures, perceived usefulness and perceived ease of use. Perceived usefulness as the degree to which a person believes that using a particular system will benefit them in their job performance. In addition, perceived ease of use is the degree to which the use of the system would be free from effort. The advantage of this measure is its simplicity. The technology can have a multitude of capabilities; this is useful only if the users perceive that it is useful for their job.

However, technology acceptance theory is criticized as having limited explanatory ability. It is not possible to predict using technology adoption theories if potential adopters will adopt a system based on perceived usefulness and ease of use (Chuttur, 2009). Davis (1989) argues that technology acceptances theory lacks any practical value. Furthermore, adopters of technology are influenced by many factors; some of these factors include their ability to use the technology, its affordability and its compatibility with their value and culture.

2.8.2. Contingency Theory

Tornatzky and Fleischer (1990) developed a framework for organizational adoption based on probability theory of organizations. This theory suggests that an effective organization should have a structure which is responsible with its environmental needs. The effectiveness of an organization is based upon its suitability towards both internal and external factors such as environment, organization size, organization strategy and technological factors to make a decision.

A fundamental idea behind contingency theory is that organizational feasibility is dependent on an appropriate fitness between the organization and its environment. An organization is considered an unclosed system, which stresses the complexity and inconsistency of the individual parts, individual participants and subgroups as well as the shapelessness of connections among them. In order for the organization to be feasible, it must be able to visualize and incorporate the contingencies of its environment into its premises (Donaldson, 2001).

The theory is applicable to the study since organizations operate in different spheres, have different management styles and an individual composition of staff. Hence, to follow the idea behind contingency theory, each organization must monitor its own environment and realize that organizations have to deal with different situations in different ways. The technology, organization, and environment framework has been adapted in IT adoption studies in the past and it provides a useful analytical framework that can be used for studying the adoption and assimilation of different types of IT innovation (Oliveira & Martins, 2011).

So that, to have success in a rapidly changing and dynamic environment, the organization must be flexible, internally dynamic and have the capability to renew and innovate.

2.9 .Empirical Evidences

This section provides a review of studies which have been done in the past regarding the factors affecting ICT adoption and Uses. The empirical study identifies the studies, authors, areas of investigation and the findings reported.

Sang-Gun L, et al (2013) undertook a study on Innovation and simulated effects in technology adoption in South Korea and found that, the improvement effect is more powerful for innovators and opinion leaders than it is for all adopters. However, it diminishes as time passes. On the contrary, the simulated effect becomes a more powerful factor for the early majority, late majority and laggards as explained by Rogers (2003). The simulation effect in the ICT manufacturing is greater than that in the non-ICT manufacturing, see-through the high network effect in ICT diffusion.

Mengistu (2016) studied the ICT adoption evidence from Ethiopia findings show that major reasons that were hindering ICT adoption are a group of factors that are related with the technological issues of the organizations. The results of the finding suggested that, have of localization- languages user interface, have of training and consulting about the new versions of existing software significant factors influencing the adoption of new technology ICT among the staffs.

Malisa Mazlan used Roger's theory to investigate the technological factors that may affect the ICT adoption process among Halal certified organizations in Malaysia. They found that the organizations have a high degree of adoption in the variables of relative advantage, compatibility, trial ability, observe -ability, image and complexity. According to Rogers (2003) relative advantage is the degree to which an innovation is apparent as being better than the idea it supersedes, while compatibility is the degree to which an innovation is apparent as consistent with the existing values, past experiences, and needs of potential adopters including both organizations and individuals. Roger further defines observe-ability and trial-ability as the degree to which the results of an innovation are visible to others and the degree to which an innovation may be experimented with on a limited.

Meseret (2010) studied the influence of the organizational factors on ICT adoption focus on the organizations on size. The purpose of the study was to analyze the effect of size and other organizational factors such as, IT knowledge, IT external support and the level of employees'

education on the use of ICT services. The result as displayed shows corporate strategies and organizational factors as the highest driving factors in the high level drives ICT adoption. Environmental factors and management capacity are the leading medium level drives while management capacity and task level factors are leading the low level drives.

Mpofu and Lorraine (2011) conducted research on understanding ICT adoption in Southern Africa covering South Africa, Botswana and Zimbabwe. The results highlighted the individual distinctive behavioral characteristics as well as the stage of ICT adoption reached by each case study. The study found that, in case studies that operated in a stable environment; with organizational readiness; financial and owner managed seemed readily engaged in ICT adoption.

Michael (2011), studied investigated that the key factors influencing ICT adoption in South Africa with focus on capacity to adopt and use ICT, disclosure to international environment and state policies. The study established that capacity to adopt and use ICT has the most significant influence on ICT adoption in South Africa, followed by contact to international environment. The effect of state policies was surprisingly not significant, deviating from the general rights that policy implementation and adoption of such policies are key determinants of adoption.

The studied adoption of information and communication technology in the Public Sector in the Ghana found out the low level of adoption of ICT in selected public sectors identified major hindrances to ICT adoption which includes low level of ICT literacy, inadequate and obsolete equipment as well as cost of investment in ICT (Ohemeng, et al, 2013).

The studied done on the technology adoption of Ethiopian manufacturing firms, textile and leather sector find that adopt and implement new technology, resistant to change, lack of budget, lack of skilled worker and lack of technical supporting services are very influential challenges in order of priorities. Other inhibitors include lack of strategic perspective and government support that influence firm's technology adoption and implementation (Kumlachew, 2015).

2.10. Research Gaps

Table 2.1: Researcher finding and their gap

Variables	***Authors & Years***	***Findings***	***Research gaps***
Effects of ICT among public administrations	Subramanya , (2014)	Study found the problem of manual operation and redesign administrations by technological diffusion in the organization. By studying the positive impact of ICT in public administration in order to reduce ill effects of digital divide by study the population character in technology literate and illiterate to implement technology among the organization. Through qualitative and quantitative data gathering method.	There is a need to study the importance of the ICT in public administration by studying hinder challenges and factors that drive the adoptions such as technology, organization and environmental characteristics.
Challenges of ICT for Tax administrations in public administration.	Uvaneswaran & Haimanote,(2016)	Study identified challenges that hinder the application ICT like users interest using ICT in tax administration through descriptive research methodology both qualitative and quantitative approach. Found that ICT used to saving time to complete tax payment, efficient and convenient tax payment, increasing transparency intermesh in assessing of information.	The study was focus the challenges hinder the adoption of ICT in one sector by collecting the data from the top taxpayer and manager ,ICT technician, but the current researcher collect data from the proportional the organizations employees to get detail information from all sectors.
Use and factor effect ICT for Financial management in public administration	Ohemeng ,et al,(2013)	The Low level of adoption of ICT in Financial Management and identified by major hindrances to ICT adoption which includes low level of ICT literacy and low level work experience, low education background, inadequate and obsolete equipment as well as cost of investment in ICT within the financial management in the public administrations.	The study was provided clear use and factor effect ICT adoption in public administrations, by studying the characteristics of all sectors from the public administrations not only gatherer data about education level and experiences by integrating with different factors as internal and external for ICT adoption based prepare.

2.10. Conceptual Framework

Depending on the various approaches accessible above in the literature review a modified conceptual framework on ICT adoption towards the effectiveness of professional organizations are to be developed. The conceptual framework is a diagrammatical presentation of variables in the study and it is used to indicate the framework illustrates the interrelationship between dependent and independent variables. The independent variables for the study are factors affecting adoption of ICT, while, the dependent variable is the adoption of ICT. These relationships are also often illustrated by 'boxes and arrows' diagrams. However, in these cases the relationships are not based on cause and effect but on logic and proper order. Therefore the framework are to be presented in the way relationship of the organization strategies along with the ICT, organization context along with ICT, environment along with the ICT, technological context along with ICT and the ultimate sustainable growth and development are interlinked one each other and demonstrated the research assumption of organizations are responsible for societal values and environmental capability. The researcher gave the previous knowledge researcher point of view and identifying his own point of view as follows.

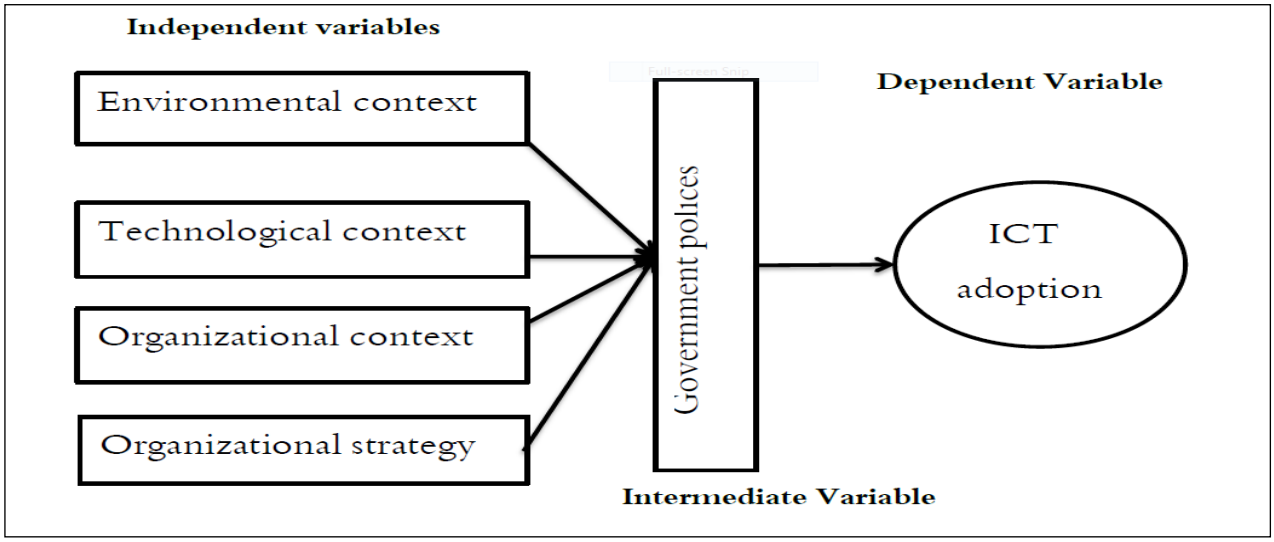

Figure 2.1: Modified Conceptual Framework

Source: ICT assimilation in public organizations (by Temtima Asefa)

2.11. Chapter summary

In generally the researcher was refer different literature, which is factors that affecting adoption of ICT, from national and international journals, articles, books, magazines and others in order to find out the researchers gaps, The objective of this study is to examine factors that affect adoption of ICT in a particular governmental sectors. The researcher reviewed literature on area those are research done on public administrations and technology adoption in government and non-governmental organizations in different parts of the world. Based on the he developed a conceptual framework that indicates the relationship between dependent and independent variables.

CHAPTER THREE

RESEARCH DESAIGN AND METHODOLOGY

3.1. Introduction

This chapter details the overall method that was used in the study. This is organized into research design, target population of the study, sample size, sampling techniques, sampling procedures, data collection methods, research procedures, method of data analysis and ethical considerations.

3.2. Research design

In order to achieve research objective and to give answer to the questions certain research design and data analysis techniques had been applied accordingly. Therefore, in based on the specific objective of the research, this study cross-sectional design had been implemented; because, the cause and effect of the study are made at the same time. And also the duration of data collection and other activities take place within a limited time.

There are three common approaches to conduct a research project in the area of business and social sciences namely. So, in this research both quantitative and qualitative approaches had been implemented. Qualitative approach helps bring out the feelings and norm of the respondents while quantitative research involves the measurement of quantifiable values; and also helps to generate statistical information. In fact qualitative data tends to be open-ended without predetermined responses, while, quantitative data usually includes closed-ended responses such as found on questionnaires or psychological instruments and had reduces bias and weaknesses. The collection of both quantitative and qualitative data neutralized the weaknesses of each form of data.

3.3. Target Population

The entire employees those are found in the two public administrations of Bereh and Sendafa Woredas had been taken as a study population. All employees those are done in the randomly selected study sectors and working with ICT and related subject areas for at least six months prior to data collection had been considered as target population. However, the final study units were the selected employees those are working in the study areas and fulfill the inclusion criteria indicated in the scope of the study.

3.4. Sample Size

If researcher uses survey as an appropriate, the sampling technique can be make confident and the results that would be generalized to the population. If to do so the sample size has also to be sufficient for the purpose of the analysis for intend perform. The following formula had been used to determine the sample size of the study (Mugenda & Mugenda, 2008).

$$n = \frac{N}{1 + N(e)^2}$$

Where,

n - Is the sample size of the study unit

N- Is the study population

e- Is the level of precision (10%)

Where $n1 = \frac{593}{1 + 593(0.1)^2}$ = 86 of Bereh woreda

$$n2 = \frac{399}{1 + 399(0.1)^2} = 80 \text{ of Sendafa Woreda}$$

When applied this formula as above, a sample size of 86 was used from the Woreda public administrations and 80 sample sizes was used from the Sendafa woreda public administrations. So, if the samples proportionally distribute in each sectors the allocation seems as following (Table 3.1 & 3.2): Due to their there may be unreturned research questions, researcher was added 34 respondents to the Bereh Woreda public administration

and 30 respondents to the Sendafa Woreda public administrations to the normalized sample size, so that 118 sample size selected from Woreda public administrations and 112 sample size selected from town public administrations.

Table 3.1: sample size of Bereh Woreda population

Name of sectors	N	%	Sample size (n) -86
Finance sector	41	6.9	6
TVET sector	11	1.9	2
Revenue Sector	15	2.8	2
Agricultural and natural resource sector	69	11.6	10
Justice and professional sector	10	1.6	1
Natural land and environmental sector	26	4.4	4
Health sector	117	19.7	17
Public service and HRD sector	7	1.2	1
Education affair sector	114	19.2	17
Communication affair sector	6	1.1	1
Trade and market development sector	8	1.3	1
Water, energy and mineral sector	15	2.5	2
Administrative and security sector	40	6.7	6
Civil servant sector	49	8.3	7
Youth and sport sector	10	1.6	1
Association and cooperative sector	34	5.7	5
Transportation authority	9	1.5	1
Small enterprise sector	12	2.0	2
Total	**593**	**100**	**86**

Source: Bereh Woreda Human Resource (2017)

Table 3.2: sample size of Sendafa Woreda population

Name sectors	N	%	Sample size(n)=80
Finance sector	43	11	9
TVET sector	6	1	1
Revenue sector	26	6	5
Communication affair sector	6	2	2
Rural land and environmental protection sector	4	1	1
Justice professional legal practice sector	13	3	2
Health sector	50	12	10
Public service and HRD sector	9	3	2
Education Affair	10	2	2
Trade and marketing development sector	14	3	2
Water, energy and mineral sector	30	8	6
Administrative and security sector	29	7	5
Civil servant sector	19	5	4
Youth and sport sector	10	4	3
Transport authority sector	22	5	4
Small enterprise sector	24	6	5
Court and police commission	84	21	17
Total	399	100	80

Source: Sendafa Woreda human Resources (2017)

3.5. Sampling Techniques

The study also employed both purposive and random sampling techniques, in order to contact potential respondents.

3.5.1 Purposive sampling

Purposive sampling technique was used for selection of various staff in the different public administrations that encouragement ICT adoption as they are considered competent in providing the required information. According to Denscombe (2008), purposive sampling starts with a

purpose in mind and the sample is thus selected to include people of interest and exclude those who do not suit the purpose. due to a limited number of resources in each sectors and getting a better information for the qualitative study the researcher select purposively a potential respondents those have more knowledge about the research questions The method was therefore suitable in selecting the managers who have been engaging in ICT adoption for a reasonable period of time. Denscombe (2008) also posited that, purposeful sampling is useful when one wants to access a particular subset of people.

3.5.2. Simple Random Sampling

This study used simple random sampling method which is a probability method. It further helped in the process of identifying the respondents for data collection. The sample size was established and the procedure for establishing is explained as follows. For the selection of the last sampling units of the two organizations, simple random sampling technique was implemented. The sampling frame was prepared from the official list of the organization. In generally to do this:

- The researcher was took the list of target population from the human resources both organization separately and then import to SPSS sector by sector.
- Sort the list of target population from A to Z.
- Define the sample size according to the condition by using the give formula
- then computer would give the result of sample according to your sample size

3.6. Methods of Data Collection

To collect data case observation, in-depth interview and survey questioner were used.

3.6.1. Observation

To collect this data, simply the researcher observes the environment of the organization count the numbers of ICT tools and the performance of employees how they are friendly use the materials. Also used to, confirm how much the respondents' response would be true to verified their responses. The researcher has observed

- How users using Internet services in offices.

- The available infrastructures - both hardware and software – and how fast documents can be accessed from the Internet and how fast pages opened on the users' browsers.
- How technical support is given to the users in the offices?
- What challenges that exist in those offices?
- What are the available ICT tools in the institutions?
- How the Employees perform in their offices?
- How they give the service for their citizens?
- How they share data among the sectors?

3.6.2. In-depth face to face interview

Here with the concerned public administrations and sectors managers who was purposively selected was interviewed about the following important issues:

Hardware related interviews

- Is there server computer in your organizations? If yes how many?
- How many computers in your sector?
- Is there switch in your sector? If yes how many?
- Is there hub in your sector? If yes how many?
- Is there router in your organizations?
- What are the responsibilities of ICT sectors for the public administrations?

Software related interviews

- What software you use to property management system?
- What software you uses document sharing?
- What software property Management System?
- Do you use enterprise resource planning system?

Internet Service relating interviews

1. What internet services you use? (Fixed and wireless).

Network relating interviews

1. What network types you implements? (LAN, MAN and WAN)?

In this method is implemented to meet with the purposive informants, mostly managers in each sector.

3.6.3. Survey questionnaires

The researcher prepared and distributed a structured questionnaire to obtain the required quantitative data from the selected sample of concerned participants. The questionnaires in the survey had been designed to be easily understood by respondents. Moreover, during the completion of the survey, it was explicitly filled by selected officials with the support of enumerators. Basically, the questionnaires designed based on English version, but it translated into Afan Oromo by Afan Oromo expertise for ease of usage for enumerators.

For the data collection process, experienced data collectors those worked in the study areas were participated. Before the data collection procedures began, the researcher gave training for the enumerators for four days.

The purpose of the questionnaires was to gather the responses of these subjects regarding the situation in that affect the ICT adoption in administrations purpose and at their sectors in general which were related to the acceptances and uses of ICT in administrative process and also sought to produce respondent's opinion about the adoption of ICT in public administrations.

The questionnaires adopted from Nyaggah (2015) who did ICT factors influencing adoption of ICT in public hospitals, Mengistu (2016) who did, ICT adoption in uparez business private limit company and Meseret(2010)who did on , ICT adoption model for Ethiopian banking industry and prepare based on the interviews and changed to the researcher study area version by researcher.

3.6.4. Sources of Data

In order to mitigate the stated objectives the researcher used both primary and secondary sources of data. The primary data collected from the survey made on Bereh and Sendafa Woredas public Administrations regular employees .The secondary data collected from records and documents those are found in Bereh and Sendafa Woredas. Electronic sources were also better sources to collect information.

3.6.5. Data analysis Techniques

The data collected was analyzed using descriptive statistics and graphical method to achieve the objectives of the study. The process of data analysis involved several stages, the completed questionnaires were edited for completeness and consistency, checked for errors and omissions or missing. The research yielded both qualitative and quantitative data. The qualitative data collected was analyzed through content analysis by collecting similar idea together and develop the thematic framework and generalized. The quantitative data generated was analyzed using descriptive statistics frequencies, percentages, sum and exploratory factor analysis (EFA) for grouping purpose .The findings were presented using tables and bar graph, pie chart and percentages. Correlation analysis was employed for analysis. It's a measure of the degree of relationship among two or more variables that have been obtained from the same sectors of subjects.

3.7. Validity and reliability

In order to reducing the possibility of getting higher errors attention should be needed. For to do so, these are types of systems: reliability and validity, which helps of detecting the presence or absence of those problems and action have to take to reduce the problem.

3.7.1. Validity

Validity is the extent to which collection methods accurately measure what they were intended to measure and concerned whether the findings are really about what they appear to be about. A direct contact was made with the respondents in connection with the measurement of the scale (personal interviews). Thus, it was able to safely determine that the measuring results given an indication of what the research intended to examine. Besides, the questionnaire was carefully designed based on the piloting respondents' response. It was also reviewed, commented upon, modified, and finally approved by the advisor and experts who have experience with in the research area.

The researcher was conducted pilot study on another similar two Woredas, both areas public administration offices; for to do so thirty (30) respondents were taken out from the two organizations. Basically those respondents were not the part of the main study. The researcher took them to make sure that whether everyone would understand the data collection instrument or not. So, the piloting study tried to include both elder and young

people, well-educated and less educated, native Afan Oromo speakers and recent immigrants. That helps to review the quest inners according to the respondents' points of view.

3.7.2. Reliability

Reliability is concerned whether the procedures of data collection and analysis will generate the same results on other occasions or will other observers make similar observations and arrive at conclusions from the raw data.

In order to measure the consistency of the questionnaires and the overall reliability of constructs that it is measuring, a reliability test was carried out based on Cronbach's Alpha coefficient. Cronbach's Alpha can be interpreted as like a correlation coefficient; its coefficient range lay on the value from 0 to 1. A reliability coefficient (alpha) is higher than or equal to 0.7 considered as acceptable reliability. That means the targeted questions raised in the questionnaires are capable to answer the objective of the study. Therefore, the reliability test accomplished that all the items of the pilot questionnaire has been reliable since the scores of the test was higher than 0.7 as in the table below. Hence, the responses generated for all of the variables' used in this research were reliable enough for the data analysis.

Table 3.3: reliability statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.932	0.924	17

Source: Computation based on data from author's field work, 2017

For each items the researcher was generate the following result Cronbach's alpha, no item was deleted because as the Cronbach's alpha values for seventeen item was greater than 7.0 that is 0.924.

Table 3.4: Item-Total Statistics

Items	Scale Mean	Scale Variance	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha for Each items
Improved quality service delivery	50.01	144.070	.734	.803	.916
Expand organization geography	50.11	143.420	.739	.823	.915
Improve organizations performances	49.97	143.123	.764	.788	.915
Organization image considerations	49.97	142.929	.808	.817	.914
Organization scope	50.02	143.551	.798	.808	.914
Centralized managements	50.12	142.033	.796	.679	.914
Top management support	50.11	144.691	.668	.543	.917
Manager innovativeness	50.32	146.079	.574	.395	.920
Manager ICT awareness	50.18	146.395	.632	.522	.918
Citizen's pressure	50.28	143.178	.680	.677	.917
Organization trends	50.17	140.068	.812	.786	.913
Government support and initiative	50.12	145.860	.602	.523	.919
Speed up organization processes	50.05	143.813	.700	.601	.916
Link internal and external Organizations	49.91	145.809	.718	.711	.916
Employees attitudes	50.95	161.965	.045	.061	.933
Availability of ICT infrastructure	50.69	166.573	-.111	.077	.936
Launch new information from different direction	49.92	147.577	.659	.634	.918

Source: Computation based on data from author's field work, 19 Jun 2017

3.8. Chapter summary

In generally the researcher was design the method of the study that used for achieve the specific objectives, so to achieve this researcher was uses both qualitative and quantitative approaches to collect data. The qualitative approach helps to conduct the qualitative research. So, the samples were selected purposively. The random sampling technique was used to select the last study units. The instruments, which helps to collect both primarily and secondary sources of data seats like observation report, depth interviews and survey questionnaires.

3.9. Ethical Considerations

Professional ethical standards should be noted during all phases of the research process. Throughout this study the researcher strived to adhere to ethical research considerations and professional guidelines. This involved avoiding acts of misconduct in research, such as data construction, misrepresentation and copy. Authorization to conduct the study was obtained from the relevant experts before origination of data collection. During data collection the researcher explained the aim and significance of the study to the respondents by showing the formal letter obtain from AAU and consent for participating in the interviews and observation discussions was sought from them. The researcher ensured that the information collected was treated with due confidentiality and was used purely for research work.

CHAPTER FOUR

RESULT AND DISCUSSION

4.1. Introduction

In here the collected data is analyzed in a manner where interpretations could be done and knowledge could be derived or retrieved from it. This was where the research questions come to answer and the objectives of the research come to be resolved and achieved. In this part of the data analysis, reports about ICT adoption of Bereh and Sendafa Woredas public administrations was illustrated using narrative descriptions supported with graphical presentations. The report included organizations background in terms of their contribution, challenges of ICT adoption, factors affecting ICT and influence of ICT adoption of Bereh Woreda and Sendafa Town public administrations.

4.2. Questionnaire Response Rate

The study targeted to collect a total of 230 respondents response, whereas, from them only 187 respondents filled in and returned the questionnaires; i.e., a response rate of 81.3%. According to Mugenda and Mugenda (1999), a response rate of 50% is adequate for analysis and reporting; a rate of 60% is good and a response rate of 70% and over is excellent. So, based on the assertion, the response rate was excellent as indicated by Table 4.1.

Table 4.1: rate of respondents

Variable	**Frequency**			**V %**
Returned	187	Bereh Woreda	105	45.6
		Sendafa Woreda	82	35.6
Unreturned	43	Bereh Woreda	13	5.7
		Sendafa Woreda	30	13
	230	**-**	**230**	**100**

4.3. Respondents' profile

The study sought to establish the demographic information of the respondents in terms of work organizations, gender distribution, and level of education, period of service or work experience and age of respondents. For instance, from the entire valid respondents 105(56.1%) were participated form Bereh Woreda and the remaining 82 (43.9%) were from Sendafa woreda public administrations (Table 4.2). The study sought to establish the period which the respondents had served in the organizations as indicated in (Table 4.2). As their response 54(28.9 %) of them have below 5 years of work experience, 79(42.2%) have between 5 to 10 years, 37(19.8 %) have 11 to 20 years, 17(9.1%) have worked above 20 years in the Bereh Woreda and Sendafa woreda administrations(Table 4.2).

Concerning with sex distribution, 130 (69.5%), respondents are males, whilst, the remaining 57(30.5%) study participants are females of administration staffs of Bereh Woreda and Sendafa woreda public administrations(Table 4.2). Among the two public administrations staff participated in the research 2 (1.1%) of them are less than 20 years of age, 170 (90.9%) are between 20 and 40 year of age, 15 (8%) between 41 and 60 are age distributions of Bereh Woreda and Sendafa woreda (Table 4.2). In the case of education level concern, 42 (22.5 %) respondents had college diploma, 130 (69.5 %) were degree holders, 14(7.5%) respondents are TVET graduated and the remaining 1 (0.5 %) participant is a doctorate holder (Table 4.2).

Table 4.2: Respondents profile

Variables	Frequency (n=187)	Percentage (%)
Respondents organization		
Bereh Woreda	105	56.1
Sendafa woreda	82	43.9
Work experience		
Below 5 years	54	28.9
5 to 10 Years	79	42.2
11 to 20 years	37	19.8
Above 20 years	17	9.1
Sex of the respondents		
Male	130	69.5
Female	57	30.5
Age of the respondents		
Below 20 years	2	1.1
20 to 40 years	170	90.9
41 to 60 years	15	8.0
Education level		
Diploma	42	22.5
Degree	130	69.0
TVET	14	8.0
Dr.	1	0.5

Source: From field work survey, April, 2017

4.4. Findings

This section discusses the key findings as considered under each specific objective. The quantitative data collected were fed into the Statistical Package for Social Sciences (SPSS) version 20 package and many available features of Microsoft Excel was used for the analysis purpose and analyzed based on research objectives in chapter one and the qualitative data was analysis by grouping and generalization.

4.4.1. ICT Sectors and its functions

In the civil service offices ICT sectors in the Bereh Woreda and Sendafa town ICT sectors are presented. According to the key informant interview findings, the ICT sectors of the organizations are responsible for the following major duties and responsibilities:

- Provide list of ICT works
- Provide the computer maintenance
- Make available necessary inputs for ICT
- Organize project team for ICT assignment
- Provide training on ICT framework and platforms, and ensure proper usage
- Keep all necessary ICT documents and provide on request.
- Getting verification and confirmation for deliverables from user unit
- Attend discussions that prepared for ICT idea exchange and progress evaluation
- Giving approval for tested ICT works
- Initiate payment for ICT works.
- Installing and uninstalling application and system software
- Configuring computer network
- Managing computer network

Sources: From Key informant managers interviews among each the sectors

4.4.2. ICT Components of Bereh and Sendafa Woredas

Bereh Woreda and Sendafa woreda ICT components collected from observation and interview are presented as follow on each sub component(source: Bereh Woreda ICT manager).

4.4.2.1. Computer hardware platforms

According to the observation did in the study area, in order to facilitate its works, Bereh Woreda and Sendafa woreda had only functional as standalone fifteen(15) and ten(10) personal computers respectively were purchased (as desktop and laptops).

The observations are also on the brand of the computers in the organizations and findings that there are a numbers of desktops and laptops are using Intel Microprocessors with a network interface, with Intel memory, and network connections. There is no central server computers on a network that performs important network functions for client computers, such as serving up Web-Pages, storing data, and storing the network operating system (and hence controlling the network) this server was located at Oromia Special zone surround finfinne not at Woreda level.

4.4.2.2. Operating system platforms

According to the observation and interviews result investigated, Bereh Woreda and Sendafa Woreda have mostly used Windows-Based operating systems such as windows7 and 8 for their client deliverable services

4.4.2.3. Data management and storage

According to the key informant interview findings, there is no main DBMS is located in each public administrations. Each Public organizations store data in manual document called as mother document and sometime in personal computer no access data through the network and internet platforms(source:- from key informants).

4.4.2.4. Networking platforms

According to observation of researcher and key informant interviews, researcher found both Bereh Woreda and Sendafa woreda selected public administration offices do not have servers, one switch, and no router. The public administrations were uses the server which located at the center of the Woredas of oromia special zone administrations.

From the interview information and observation result only Bereh Woreda was also use network that contain a switch acting as a connection point between the computers. In order to connect personal computers and other digital devices at ICT office level only Bereh Woreda has used Local Area Network (LAN) with switch organized into a hierarchy among ICT sectors only. The network is designed based on star network topology; some devices on the network connect to one switch. The network traffic from the devices flows through the switch and extended to another computers connected together in star network. Bereh Woreda uses the dominant LAN standard or protocol called Ethernet. It specifies the physical

medium to carry signals between computers, access control rules, and a standardized set of bits used to carry data over the system. It has data transfer rates of 200 Mbps, but no network platform at the town administrations. Bereh Woreda has also Wide Area Network (WAN) to connect or integrate its others' Woreda and with center of administrations head office at Oromia special zone .

4.4.2.5. Internet service

Public administrations are using internet synchronization and asked public Internet protocol address for its remote communication with its out lets. The telecommunications platforms are based the transmission control protocol or Internet protocol suite as a standard. They are provided by Ethio telecom which is the only Internet service provider in the country (FDRE-MCIT, 2009). The broad band internet connection is digital subscriber line which has 6Gbs data transfer rates. The public IP address requested has three usable slices used for remote support.

4.4.3. Access to Computer System of respondents

The respondents' access to the ICT facilities was measured in terms of their access to computer system in their work place for administrative purpose. According to the result 149 (79.9%) participants did not use computer on their offices. Likewise, 141(75.4%) employees do no create their own mail account. As per the 175(93.4 %) respondents responded, their offices do not networked with connection (Figure 4.1).

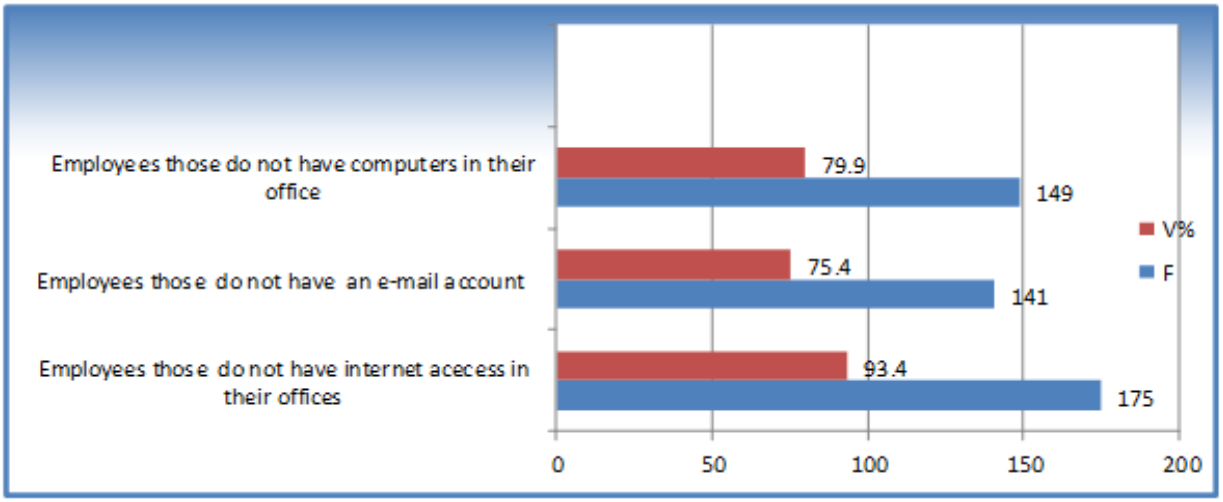

Figure 4.1: access computer system of respondents

Source: From field survey work .April 2017

4.4.4. Computer Skill and knowledge

The computer skills of the respondents are presented in (table 4.2) below. From entire valid percentages, the highest percentage of the respondents means 130(69.5%) respondents had no skills are occupied in operate the printer connect to computer, 97(51.9%) respondents did not use viruses scanner software, 141(75.5%) participants did not browse internet for administrations purposes, 137(73.3%), respondents did not sending and receive e-mail address. Similarly, 116(62.0%) participants cannot uses excel to analysis data. Moreover, 98(52.4%) respondents informed that they cannot use word processing to typing documents, however 89(47.6%) respondents can use the computer to keep records and use word processing to typing documents, correspondingly 71(38.0%) participants can analysis data by using excel . Amicably, around 57(30.5%) respondents can operate a printer and 37 (19.7%) of the participants can now know about virus scanner software and 90(48.5%) participants can now how to analysis data using excel Microsoft.

After measuring the respondents' basic computer skill, the last data summarization was creating a comparison between staffs that use more and not use of ICT facilities.

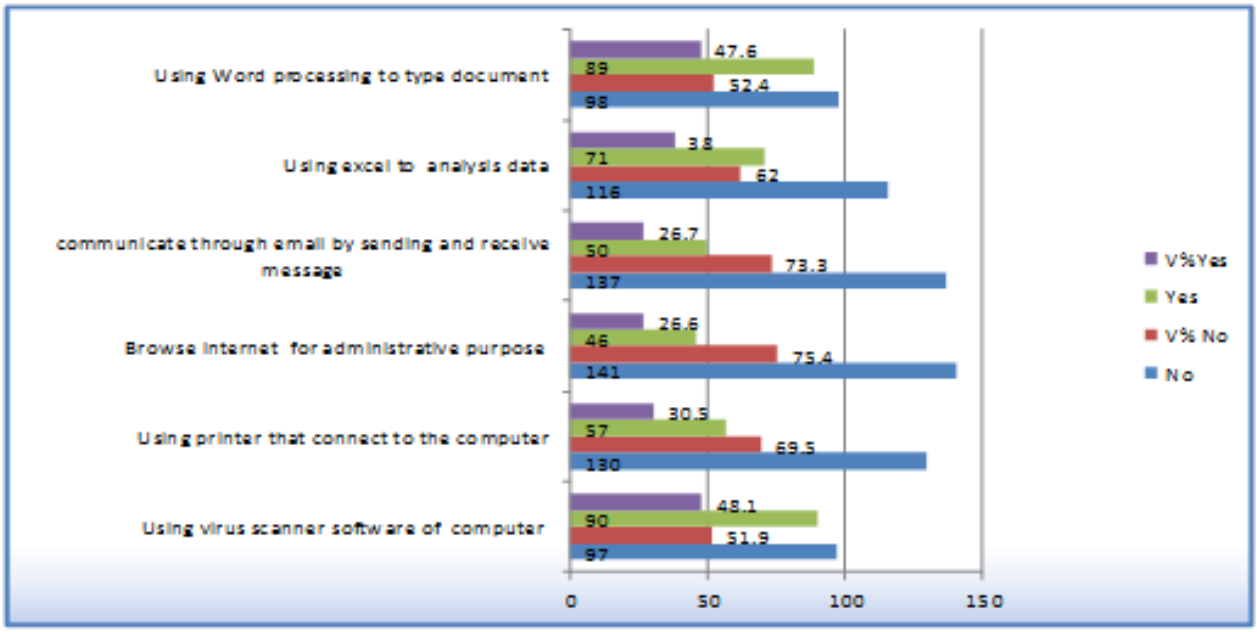

Figure 4.2: ICT Skill of respondents

Source: From field work of survey, April 2017

4.4.5. Challenges of ICT adoption

To understand the current state of affairs, the respondents were asked about the current challenges faced in the Bereh and Sendafa woredas administrates of their units. Respondents were asked to indicate the challenges of ICT adoption among the Bereh and Sendafa woredas in the form of list of questions. If there are any additional challenges, the respondents could write them down on the space provided. For this purpose, fifteen (15) challenges were identified from the literature and interview. For simplicity purpose the challenges are given a code CH for further analysis.

CH0: Scarcity of ICT resources and infrastructure in the sectors

CH1: Problems in internet connectivity and bandwidth issue (low)

CH2: Lack of confidence in using computers of employees

CH3: Lack of owner/vendor

CH4: Lack of awareness to change management

CH5: Lack of citizen encouragement

CH6: Lack of training facilities

CH7: Lack Management support

CH8: Lack of government encouragement

CH9: Inadequate funds in the organizations

CH10: Problem in strategies development

CH 11: New version of existing software

CH12: Fear of employees on personal values

CH13: ICT device and applications are too expensive

CH14: Lack of localization- languages user interface

As table 4.3 shows, the more than half respondents identified major challenges which hinder the adopting of ICT among public administrations. According to the found shown about 145(77.5%) respondents responded that there were challenge on the scarcity of ICT resources and infrastructures, 136(72.7%) respondents said that there were the problems in Internet connectivity, and 123(65.8%) of the respondents responses yes to show that there are challenges on the of training facilities about how to use the new technology plus, 118(63.0%) respondents said that there were challenges of the lack management support, 117(62.9%) participants answer that there were inadequate funds in the

organizations,116(62.0%) respondents said there were a problem of adopting new version of existing software, 114(61.0%) respondents show that there no citizen encouragement and 110 (58.8%) respondents inform that there were a problem in strategies development as well as 101(54.0%) respondents said that there was the problem availability of vendor participations in or to the organizations that make as they did not accept the ICT. Moreover 99(52.9%) and 99(52.9%) respondents responded that lack of localization- languages user interface and lack of government encouragement are another challenges meet the organizations.

But more than half respondents said nope, entail that 133(71.1%), 109(58.3%), 88(47.1 %) and 83(44.3%) respondents responded that there were no challenges on the ICT device and applications are too expensive, fear of employees on personal values, lack of confidence in using computers of employees, and lack of vendors are no a challenges occur within the organizations respectively. On the other hand, around 22(11.7%) respondents had not gave any information on lack of training facilities, besides 21(11.2%) respondents not said any things about the lack management support, furthermore 20(10.7%), 20(10.7%) and 20(10.7%) and 20(10.7%) participants in the organizations had no gave any information about the variable of scarcity of ICT resources and infrastructure in the sectors, problems in internet connectivity and bandwidth issue (low) and lack of localization-language user interface as well as lack of government encouragement correspondingly by order.

Table 4.3: Challenges of ICT Adoption

	Yes		No		Don't know	
Variables	*Frequency*	*%*	*Frequency*	*%*	*Frequency*	*%*
CH0	145	77.5	22	11.8	20	10.7
CH1	136	72.7	31	16.6	20	10.7
CH2	79	42.7	88	47.1	19	10.2
CH3	101	54.0	83	44.5	3	1.6
CH4	96	51.3	73	39.0	18	9.5
CH5	114	61.0	61	32.0	12	6.4
CH6	123	65.8	42	22.5	22	11.7
CH7	118	63.0	48	25.6	21	11.2
CH8	99	52.9	68	36.4	20	10.7
CH9	117	62.9	54	28.9	16	8.6
CH10	110	58.8	70	37.4	7	3.7
CH11	116	62.0	63	33.7	8	4.3
CH12	59	31.9	109	58.3	19	10.2
CH13	46	24.6	133	71.1	8	4.3
CH14	99	52.9	68	34.6	20	10.7

The study aimed at identifying and analyzing how the public administrations of Woredas use ICTs to administrate related information. Challenges that could be limiting the adoption of ICT in Bereh Woreda and Sendafa woreda were identified as the issues related with ICT adoption. It mainly focused on identifying major ICTs challenges that hinder the adoption ICT to the public administrations.

Most challenges were identified by more than half (55%) of respondents summarized by bar graphic were presented as follows comparing with the respondents who said yes by relating with respondents who said no and don't know. The list begins by stating the mixed the result of table 4.3 and figure 3.4. like 145(77.5%) respondents responded that there was challenge of scarcity of ICT resources and infrastructure in the sectors but ,22(11.8%) respondents responded with contradict with this challenges ,likewise 20(10.7%) participants said, don't know about this variable, similarly 136(72.7%) respondents said that there was challenge low internet connectivity and bandwidth issue for ICT investment in the sectors, however 31(16.6%) participants answered that there was no challenge of low internet connectivity among the sectors, on the other hand 20(10.7%) respondents did give don't know responses.

In the same way 123(65.8%) respondents responded that there are lack of training facilities in the organizations, thought 42(22.5%) respondents said there is training in the organizations, conversely 22(11.7%) respondent gave don't know answers.

Equally,118(63.0%) participants responded that there were a problem of lack of management support to adopt ICT, reverse that 48(25.6%) respondents said that there were a managements support in the public administrations, in this side 21(11.2%) respondents gave the answer of don't know, by the same token 117(62.9%) respondents responded that there was challenge of inadequate funds in the organizations ,in contrary 54(28.9%) respondents said that there was adequate funds, again,16(8.6%) respondents said don't know. Alike 114(61.0%) observers said that, there were a challenge of lack of citizen encouragement around the organizations, conflicting that 61(32.0%) viewers said that the citizens were encouraging the public administrations, over again 12(6.4%) watchers did give don't know.

Finally, 110(58.8%) respondents said that, there was a challenge of strategies developments in the organizations, as opposite 70(37.4%) respondents said that, the organization have ICT investment strategies, all over again 7(3.7%) respondents gave don't know answers. detail information's was presented in table 4.3 and figure 4.3.

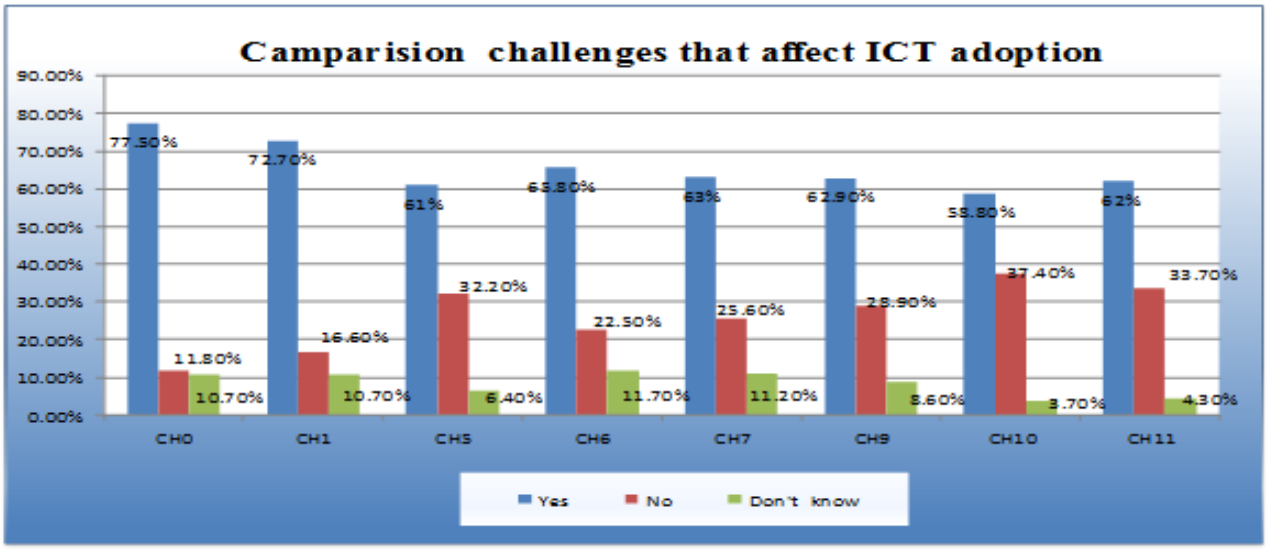

figure 4.3:Comparison of challenges of ICT Adoption

Source: From Field survey work, April 2017

The above challenges identified in (Table 4.3) by the respondents are summarized in four main group of challenges that are presented as follows with regards to the respondents said yes, no and don't know as study area challenges. To find the group of factors the researcher uses exploratory factor analysis (EFA) that can be used to find meaningful patterns within a large amount of data. So according to the result obtain through the EFA can grouped in to four categorized like as: organizational challenges such as lack of government encouragement of the organizations, inadequate funds in the organizations, lack of management support, there is no staff development and lack of training facilities and Problem in strategies development in the organizations. Comparably there are some challenges run from environments likewise lack of owner/vendor, lack of confidence in using computers of employees, lack of citizen encouragement, lack of awareness to change management. The same as there are some challenges jump from technological like ICT device and applications are too expensive, fear of employees on personal values, new version of existing software and lack of localization- languages user interface also there are some challenges outing from organizational strategies developments on providing the new ICT infrastructure and establishing standard ICT connectivity in the organizations. Those clustering was based on the EFA which is generated as follows table for detail when the

absolute values were less than 0.45 the report is generated. Similarly the researcher was generated the Cronbach's alpha to see the reliability of the grouped items.

Table 4.4: Rotated Factors Matrix[a]

Items	Factors				
	Organizational challenges	Environmental Challenges	Technological Challenges	ICT tools strategy Challenges	Cronbach's Alpha
Lack of government encouragement	0.734				0.784
Inadequate funds in the organizations	0.599				
Lack Management support	0.538				
There is no staff development and Lack of training facilities	0.507				
Problem in strategies development	0.469				
Lack of owner/vendor		0.630			0.743
Lack of confidence in using computers of employees		0.620			
Lack of citizen encouragement		0.536			
Lack of awareness to change management		0.476			
ICT device and applications are too expensive			0.646		0.745
Fear of employees on personal values			0.625		
New version of existing software			0.546		
Lack of localization- languages user interface			0.531		
Problems in internet connectivity				0.759	0.767
Scarcity of ICT resources and infrastructure in the sectors				0.723	

More detail information would be presented in (Table 4.5), (Table 4.6), (Table 4.7) and (Table 4.8). According to their correlations the result rotational factors matrix were summarized in (Table 4.4) would grouped in table form and their average weight were calculated to know which factors where more prominent to hinder the adoption of ICT in the organizations.

Table 4.5: Organizational challenges of ICT adoption

ICT challenges	*Yes*	*No*	*Don't know*
Lack of government encouragement	52.9%	36.4%	10.7%
Inadequate funds in the organizations	62.9%	28.9%	8.6%
Lack Management support	63.0%	25.6%	11.2%
Lack of training facilities	65.8%	22.5%	11.7%
Problem in strategies development	58.8%	37.4%	3.7%
Averages	**60.7%**	**30.2%**	**9.2%**

Table 4.6: Environmental challenges of ICT adoption

ICT challenges	*Yes*	*No*	*Don't know*
Lack of owner/vendor	54.0%	44.5%	1.6%
Lack of confidence of using computers	42.7%	47.1%	10.2%
Lack of citizen encouragement	61.0%	32.0%	6.4%
Lack of awareness to change management	51.4%	39.0%	9.5%
Averages	**52.3%**	**40.6%**	**6.9%**

Table 4.7: Technological challenges of ICT adoption

ICT challenges	*Yes*	*No*	*Don't know*
ICT device and applications are too expensive	24.6%	71.1%	4.3%
Fear of employees on personal values	31.9%	58.3%	10.2%
New version of existing software	62.0%	33.7%	4.3%
Lack of localization- languages user interface	52.9%	34.6%	10.7%
Averages	**42.8%**	**49.4%**	**7.4%**

Table 4.8: ICT tools development strategy challenges of ICT adoption

ICT challenges	*Yes*	*No*	*Don't know*
Problems in internet connectivity	77.5%	11.8%	10.7%
Scarcity of ICT infrastructure in the sectors	72.7%	16.6%	10.7%
Average	**75.1%**	**14.2%**	**10.7%**

The result was generated through the bar graph based on the averagely weighted from entire valid percentage as the result elaborated 75.1% of group respondents convinced that problems of ICT tools developments strategies challenges are the leading hindrance factors for the ICT adoption among the public administrations, but 14.2% respondents responded that there were no strategies challenges in the organizations, however 10.7% respondents did give don't know answer about the strategies design problem challenges. Similarly, from entire valid weighted averagely 60.7% participants said that, there were organizational related challenges in the public administrations, nevertheless the entire 30.2% valid respondents responded that there were no organizational challenges, still 9.2% respondents did give don't know answer about the organizational challenges.

Correspondingly, the group of entire 52.3% valid observers said that, there were challenges on environmental related of ICT developments challenges , on the other hand a collection of 40.6% entire valid averages respondents said that there were no challenges related with the environmental ICT developments challenges in the organizations, silent 6.9% respondents responded that don't know. Concurrently, a set of entire 42.8% valid average of viewers, told that, there were an technological related challenges in the public administrations, yet normally the whole 49.4% participants said that there were no technological related challenges in the organization, soundless around 7.4% valid respondents did give don't know feedback about the technological challenges.

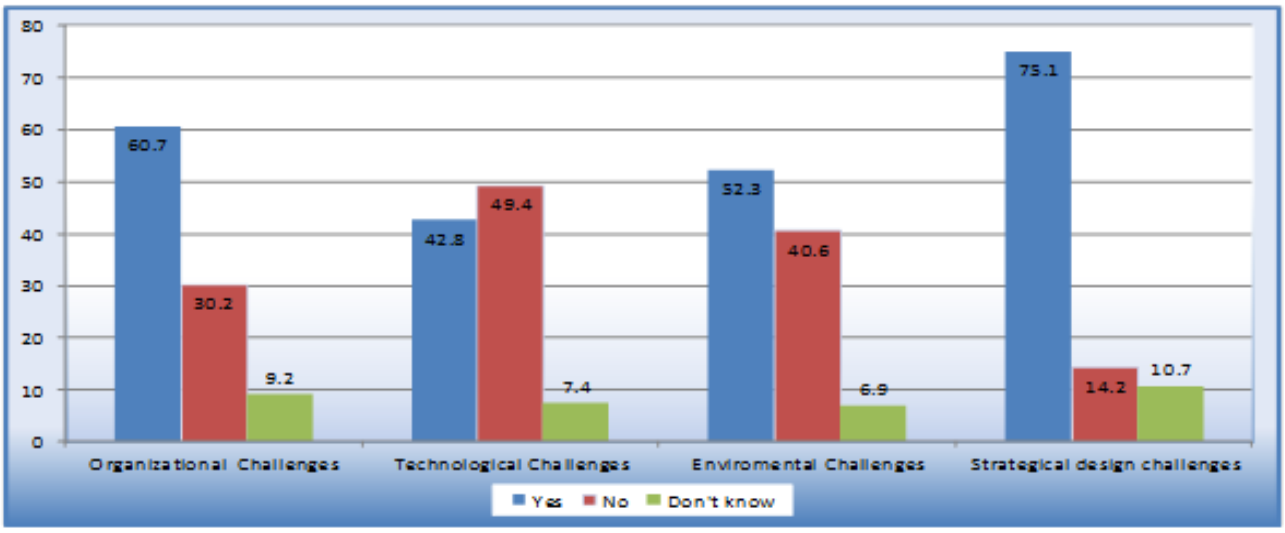

Figure 4.4: major challenges of ICT adoption

Source: from field survey work, April 2017

4.4.6. Respondents Opinion on factors that drives ICT adoption

The major objective of the research is finding the force that drive ICT adoption using different group of factors. For this reason, the factors are summarized to provide descriptive information about which factor drive ICT adoption in Bereh and Sendafa Woredas. The selected respondents are required to fill questioner to state/identify which factors drive the ICT adoption in what scale level of high, medium, and low. The general frequency of these factors is shown in the Table 4.11. For summery purpose respondents who have unsure thoughts are clustered under 'Don't know' pillar. For simplicity purpose the code are given for further analysis.

FD0: Improved quality service delivery

FD1: Expand organization layout

FD2: Improve organizations performances

FD3: organization image considerations

FD4: Organization scope

FD5: Centralized managements

FD6: Top management support

FD7: manager innovativeness

FD8: manager ICT awareness

FD9: citizen's pressure

FD10: Organization trends

FD11: government support and initiative

FD12: speed up organization processes

FD13: link internal and external organizations

FD14: Employees attitudes

FD15: Availability of ICT infrastructure

FD16: Launch new information from different direction

To find the most important drives of ICT adoption, factors were analyzed in each level: mostly as high, medium, low and none. In accordance with this, factors with highest frequency from each level are summarized as follows. From the respondents result most of them are put their responses under the highly driven force listed as level of measurements in table 4.8. To find the most powerful drives of ICT adoption, factors were analyzed in each

level: high, medium, and low. In accordance with this, factors with highest frequency and valid percentages from each level are summarized as follows.

Based on the below data in (Table 4.8), the highest ranking ICT drives in the level high were 120(64.2%) respondents responded that manager ICT awareness,119(63.9%) and 119(63.9%) participants told that the need to improve organizations performances and speed up organization processes respectively, 118(63.1%) respondents said that government support and initiative,114(61.0%) and 112(60.0%) observers said that, organization image considerations and availability of ICT infrastructure are the factors,111(59.4%) ,111(59.4%) respondents responded on the need of improved quality service delivery and link internal and external organizations respectively, 105(56.1%) respondents replied that, organization trends are the causes, 104(55.5%) participants said that manager innovativeness and 103(55.1%) respondents said that employees attitudes as well as 100(53.5%) respondents responded that need to expand organization layout, equally 99(52.9%),99(52.9%) and 99(52.9%) respondents are answered on , organization scope, centralized managements and employee pressure respectively highly important to improve ICT adoption among the organizations.

The intermediary driver factors that have capped in the medium level drives agreed by more than 50 respondents are, 54(28.9%) and 54(28.9%) respondents responded that wish to expand organization layout, manager ICT awareness are more important as drivers as well as 52(27.8%) and 52(27.8%) respondents are medium said there are need of organization scope and centralized managements respectively to drive ICT investments also 51(27.3%) participant said that, the need of improve employee pressure have some influences to drive the ICT adoption with in the selected study area.

More than 15 top factors in low level drives which are responses by 26(13.9%), 24(13.0%) 21(11.2%), 19(10.2%), 19(10.2%), 17(9.1%) respondents responded on the importance of manager innovativeness, need to improve information on decision making, top management support, organization scope, centralized managements and speed up organization processes are the lowest influences of ICT adoption in the study area. For detail information see the (Table 4.8) with the code given.

Table 4.9: Factor drives ICT Adoption

	High		*Medium*		*Low*		*None*		*Don't Know*	
Variable	*Frequency*	*%*	*Frequency*	*%*	*Frequency*	*%*	*Frequency*	*%*	*Frequency*	*%*
FD0	111	59.4	49	26.2	11	5.9	5	2.7	11	5.9
FD1	100	53.5	54	28.9	13	7.0	10	5.3	10	5.3
FD2	119	63.9	41	21.9	9	4.8	7	4.3	9	5.3
FD3	114	61.0	48	25.7	9	4.8	7	3.7	9	4.8
FD4	99	52.9	52	27.8	19	10.2	6	3.2	11	8.0
FD5	99	52.9	52	27.8	19	10.2	6	3.2	11	5.9
FD6	87	46.5	49	26.2	21	11.2	18	9.6	12	6.4
FD7	104	55.5	41	21.9	26	13.9	6	3.2	10	5.3
FD8	120	64.2	54	28.9	7	3.7	6	3.2	0	0
FD9	99	52.9	51	27.3	15	8.0	8	4.3	14	7.5
FD10	105	56.1	44	23.5	16	8.6	8	4.3	14	7.5
FD11	118	63.1	46	24.6	12	6.4	1	0.5	10	5.3
FD12	119	63.9	40	21.4	17	9.1	4	2.1	7	3.7
FD13	111	59.4	44	23.5	14	7.5	5	2.7	13	7.0
FD14	103	55.1	43	23.0	33	18.0	4	2.1	5	2.1
FD15	112	60.0	40	21.3	20	11.0	11	6.0	4	2.1
FD16	98	52.4	53	28.3	24	13.0	9	5.0	3	2.0

From the result of respondents point of views opinion the highest factor are identified by the respondents are summarized in four categorization and presented as follows. The classification based on the exploratory factor analysis (EFA) for the importance of correct classification of the elements which have common characteristics and measure about the same things. So that as shown in (Table 4.9) the most prominent factors that affect the ICT adoption are: expand organization layout, organization scope, improved quality service delivery, improve organizations performances, launch new information from different direction organization image considerations, link internal and external organizations, centralized managements, top management support, speed up organization processes. When absolute values greater than or equal 0.45 generated. The main goal of EFA is to analysis the association among the variables and simplification of items into subset or clusters of concepts measures. Method of classifications did not tell which the group of factors for the researcher only told the items which logically go together. So that technological, environmental and strategically group of factors were identified through the exploratory

factor analysis as well as the result of the Cronbach's Alpha would generate for all groups but according to the rule not item found under organizational factors.

Table 4.10: Rotated Factor Matrix[a]

Items	Factors				
	Strategically factors	Technological factors	Environmental Factors	Organizational factors	Cronbach's Alpha
Expand organization geography	0.845			-	0.945
Organization scope	0.835			-	
Improved quality service delivery	0.802			-	
Improve organizations performances	0.780			-	
organization image considerations	0.752			-	
Centralized managements	0.593			-	
Top management support	0.535			-	
link internal and external organizations		0.779		-	0.888
Launch new information from different direction		0.696		-	
speed up organization processes		0.627		-	
manager ICT awareness		0.580		-	
government support and initiative		0.579		-	
Organization trends		0.527		-	
citizen's pressure			0.843	-	.883

Like as from the above (Table 4.10) organizational strategically drivers of ICT adoption relating with the, expand organization geography, organization scope, improved quality service delivery, improve organizations performances, organization image considerations, Centralized managements and top management support. The drivers factors that jumped out from the technology and know-how of ICT includes: link internal and external organizations, launch new information from different direction, speed up organization processes, manager ICT awareness, government ICT support and initiative and organization trends.

Likewise most adoption drivers which were flown from the environmental, are contain need of citizen's pressure. The detail (Table 4.11), (Table 4.12), (Table 10.13) and (Table 10.14).

Table 4.11: ICT adoption drives under organizations strategies

ICT Drivers	*Level*		
	High	*Medium*	*Low*
Expand organization geography	53.9%	28.9%	7.0%
Organization scope	52.9%	27.8%	10.0%
Improved quality service delivery improve	59.4%	26.2%	5.9%
Improve organizations performances	63.9%	21.9%	4.8%
organization image considerations	61.0%	25.7%	4.8%
Centralized managements	52.9%	27.8%	10.2%
Top management support	46.5%	26.2%	11.2%
Average	**55.8%**	**26.3%**	**7.7%**

4.12: ICT adoption drives under environmental factors

ICT Drivers	*Level*		
	High	*Medium*	*Low*
Citizens pressure	52.9%	27.3%	8.0%
Averages	**57.4%**	**25.1%**	**8.0%**

Table 4.13: ICT adoption drives under technological factors

ICT Drivers	*Level*		
	High	*Medium*	*Low*
link internal and external organizations	59.4%	23.5%	7.5%
Launch new information from different direction	52.4%	28.3%	13.0%
speed up organization processes	63.9%	21.4%	9.1%
manager ICT awareness	64..2%	28.9%	3.7%
government support and initiative	63.1%	24.6%	6.4%
Organization trends	56.1%	32.5%	8.6%
Averages	**59.8%**	**26.5%**	**8.0%**

These the above groups factors are summarized through graphical to provide descriptive information drive of ICT investments among the public administrations. As the result shown that, in (figure 4.5), the last data summarization was created between the major classes of ICT adoption drives forces after calculated the average percentages of each classes.

The highest entire 59.8% valid averagely weighted respondents responded that the technological based drivers; similarly 26.5% respondents responded that medium technological based drivers in the same way 8.0% observers said technological were low driver of ICT adoptions. Likewise, higher entire 55.8% valid weighted averagely percentages respondents highly responded that, strategically based driver, comparably 26.3% participants responded that strategically was medium driver of ICT adoptions, relatedly 7.7% respondents answered strategically developments was low driver of ICT adoption.

The high entire 57.4% valid averagely weighted respondents told that, there were environmental based driver of ICT adoption in the organizations, also 25.1% viewers said that environmental based driver are medium to adopt ICT in the selected area, as well as 8.0% observers responded that environmental based ICT adoption is low drive of ICT to the organizations, proportionality.

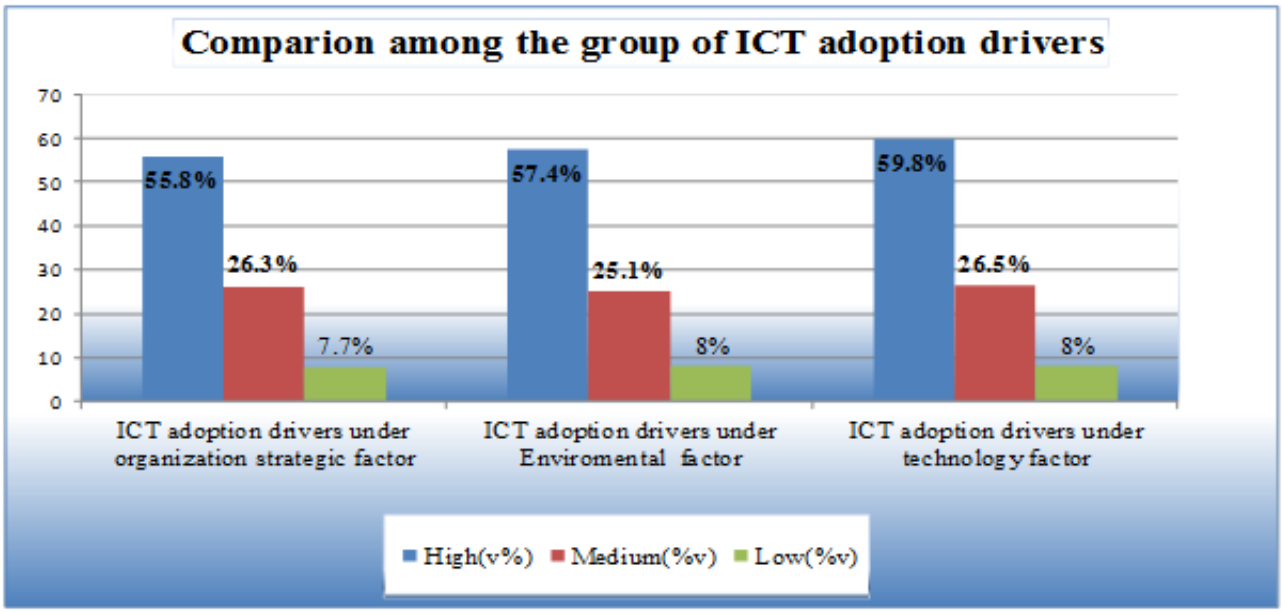

Figure 4.5: Comparison between drives of ICT adoption

Source: Computation based on data from author's field work, 2017

4.4.7. Major Influences of ICT

One of the objectives of this research is finding the influences of ICT in a contextualized. Situation from the actual people who could notice the influence and the changes that are brought since the adoption of ICTs and ICT based services in the Bereh Woreda and Sendafa Town public administrations. In addition to finding the influences of ICT, knowing the perception of the value of the influence, positive or negative, by the respondents was considered to be an importance for administrations.

The tendency of taking the influence of ICT as a positive or supportive for administrations process in all factors related with the impact of ICT on public administrations issues ultimately effectiveness was put to test to verify if it holds true. Respondents could choose the type of influence and the overall organizational activities from the list provided. The choices of the influence were positive, negative and no influence. If there are any other positive influences, the respondents could write them down on the space provided. For the simplicity the indicated factors are coded for further analysis:

CD0: Flexibility and adaptability of product
CD1: Reduction of performance cost
CD2: Motivation of staff
CD3: Data quality
CD4: Multichannel information
CD5: Trust to government
CD6: Financial report
CD7: Strength the local administrations
CD8: Strength the citizens participations
CD9: Link internal and external organizations
CD10: Strength the employees performances and professional

To find the most impact of ICT adoption, the perception of employees were analyzed in each side by side: Positive influence, negative influences, and no influences. According influences with highest frequency from each level are summarized as follows.

According to the data in table 4.9 below the study findings, more than 65% respondents said that ICT have positive influences means that 1125(67.1%) and 124(66.1%) of the

respondents believed that ICT have positive influences on the strength the employees performances and professional and flexibility, and adaptability of product in the public administrations. Likewise 120(64.0%), 119(63.6%) and 119(63.6%) participants said ICT have positive influences on financial report , on motivation of staff for developments, as well as to link internal and external organizations for certain events respectively, similarly 117(62.7%) and 115(61.5%) and 114(60.0%) participants said that ICT have positive impact on, strength the citizens participations and strength the local administrations with in the management area as well as 111(59.7%) respondents responses that ICT effect on ,to access information from multichannel sources.

Simultaneously, negative impact on of ICT responded by some respondents that is, around 22(11.8%) and 18 (9.6%) of the respondents believed that ICT have negative influences on the strength the employees performances and professional and flexibility, and adaptability of product in the public administrations. Likewise, 26(13.9%), 26(13.9%) and 31(16.6%) participants agree that ICT have negative influences on the, motivation of staff, to link internal and external organizations and to access multichannel information respectively. Also around ,21(11.2%) ,28(15.0%) and 33(17.6%) respondents responses that ,ICT have negative impact on ,increasing or strength the citizens participations , and local administrations and improve data quality for the public administrations respectively.

On the other Side, 22(11.8%), and 21(11.22%) few respondents, replied ICT have no any influences, to strength the employees performances and professional, and flexibility and adaptability of product, similarly, 29(10.7%), 21(11.2%) and 21(11.2%) respondents also state that ICT have no influences on the, to trust to government, to link internal and external organizations and to motivate of staffs correspondingly. In the same ways, 24(12.8%), 22(11.8%) and 20(10.7%) participants responded that, ICT have no any influences on the strength the citizens participations, and local administrations and to improve data quality.

Table 4.14: Influences of ICT in different administration factors

	Positive Influences		Negative Influences		No Influence		Don't Know	
Variable	*Frequency*	*%*	*Frequency*	*%*	*Frequency*	*%*	*Frequency*	*%*
CD0	124	66.1	18	9.6	21	11.22	24	12.8
CD1	107	57.2	33	17.6	15	8.0	32	17.0
CD2	119	63.6	26	13.9	21	11.23	21	11.2
CD3	114	61.0	33	17.6	20	10.7	20	10.7
CD4	111	59.7	31	16.7	17	9.1	28	14.5
CD5	104	55.6	24	12.8	29	15.5	30	16.0
CD6	120	64.2	26	13.9	20	10.7	21	12.2
CD7	115	61.5	28	15.0	22	11.8	22	11.8
CD8	117	62.6	21	11.2	24	12.8	25	13.4
CD9	119	63.9	31	16.6	21	11.2	16	8.6
CD10	125	67.2	22	11.8	22	11.8	17	9.1

Generally, what could be gathered from the result in the above table is the fact that most of the factors have a positive influence. On the other hand, while some of the factors have insignificant amount of numbers in the negative. After analyzing each factors based on their perceived influence, the major factors in the two major influences are compared against each other. In each influence is summarized as follows. Accordingly, the major factors in positive influence such as, strength the employees performances and professional, flexibility and adaptability of product, motivation of staff, strength the citizens participations , link internal and external organizations, financial report, strength the local administrations, and data quality are identified by more than 60% of respondents are summarized are presented in all as follows.

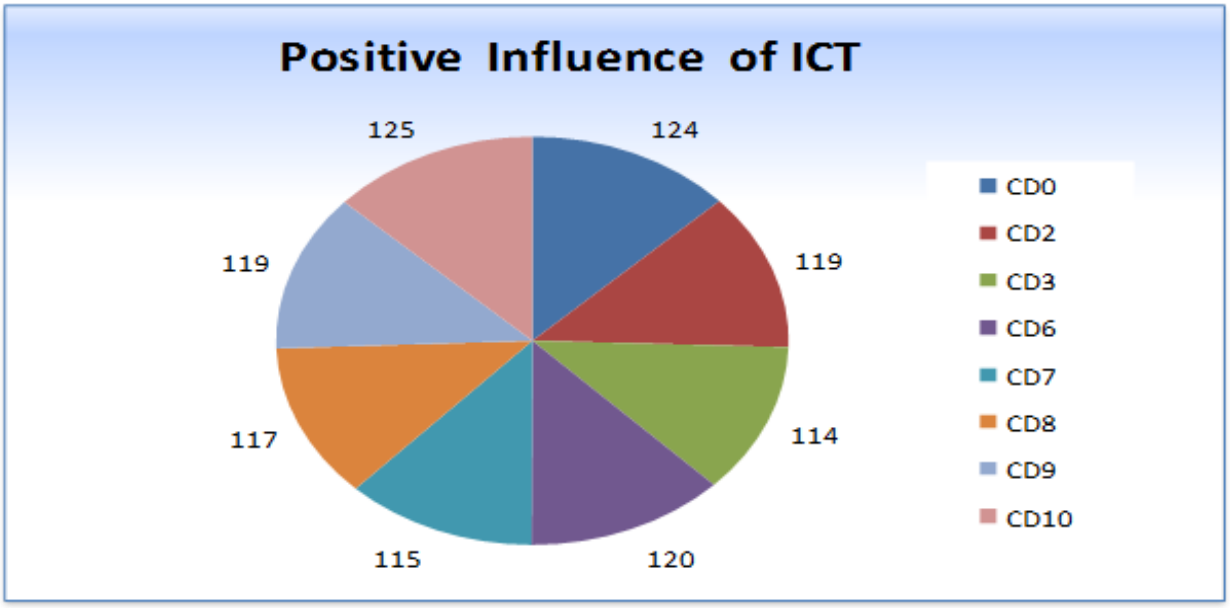

Figure 4.6: Positive influence of ICT

Source: from field Survey work, April 2017

On the other hand ground of comparing factors with each other above highly positive influences, with same some factors with more negative influence than others do. The result is summarized in figure 4.8 with minimum respondents choose.

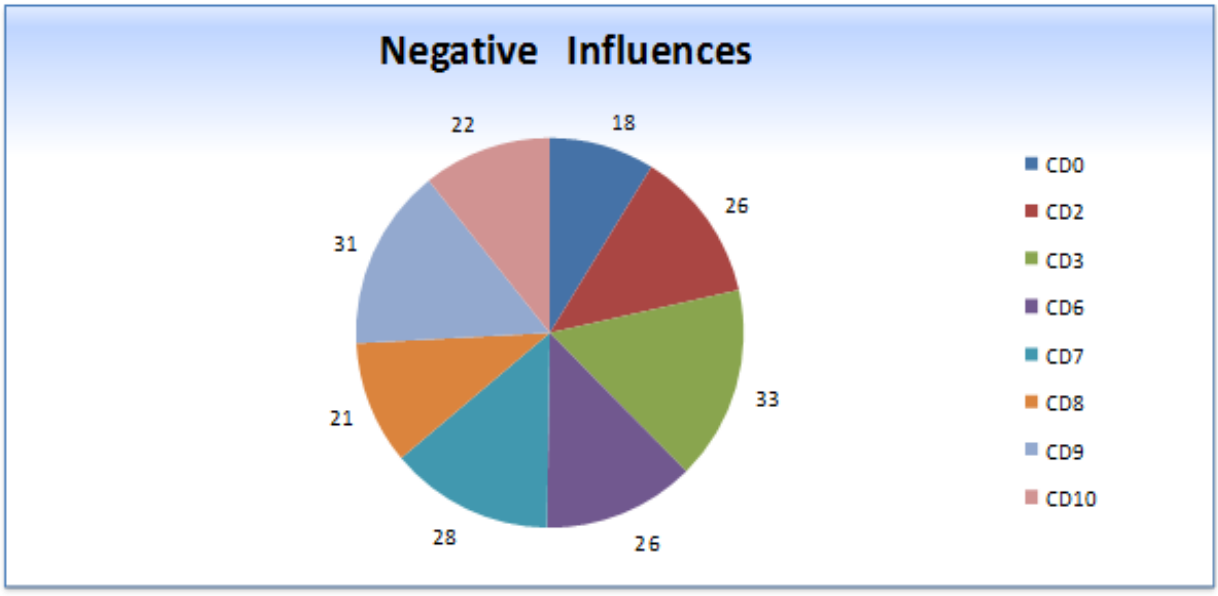

Figure 4.7: Negative influence of ICT

Source: from field Survey work, April 2017

4.5. Discussion of the Findings

The research which has started with questions to answer and objectives to achieve has come a long way passing through many vital processes. Now the researcher wish to summarize of the research's findings, implication of the research results from the perspective of the researcher and suggestions designed to surface the way for related researches.

4.5.1. Computer access ability and Skill

The study sought to identify the level of expertise of respondents in computing by asking them to know their skills in basic computer applications. There is a gap in computer skills among the administrative staffs. The employees‟ skills play an important role in the utilization of ICT.

Most of the Bereh and Sendafa Woredas public administrations personnel do not know the basic computer skill like: operate printer that connected to computers, use virus scanner software to protect their compute from danger, how to browses internet for administrative purpose and not communicate throughout the email address, not able to typing document on word processor and analysis data on the Microsoft excel. Above 141(75.4%) respondents said that there are no access computers in the offices and have not created their own email address, due to there is no internet access in the administrations. The study finding result were related with the, Gyaase, et al(2013) finding were they measure the basic skill of the respondents on perceived ease of use of ICT in financial management in adoption of Information and communication technology in the public sector Ghana, found that the most respondents who had no basic computers skill.

4.5.2. Major challenges of ICT adoption in study area

The findings show the major challenges that were hindering ICT adoption are a group of challenges that were related with the absence of ICT strategies developments problem on the issues of the public administrations: problem of establishing standard internet connectivity, timely provided ICT infrastructure. The second challenges related with group of organizational, like as lack of governmental encouragement support, inadequate funds in the organizations, lack of staff developments for training facilities and lack management support.

Correspondingly, the third challenge out from environmental out of the organizations drugging back not to move forward, likewise lack vendor, lack of confidences on using computers, lack of citizens encrougment and no awareness to change managements as well as finally there were some challenges flown form the technological challenges such as, new version existing software and lack of localized afan oromo user interface in the public administrations, mostly there were the ICT developments strategies design problem in the organizations as most respondents agree up on.

In generally when we saw individually by item by item the major challenges which were affect the adoption of ICT among the public administrations were:-lack of infrastructure, problem of internet connectivity, lack of training facilities, lack of management support, inadequate funds in the organizations, lack of citizens encrougment and inadequate ICT strategies design are the top challenges which would be hinder the adoption of ICT among the organizations or introduced too often which creates inconsistent ICT adoption in Bereh Woreda and Sendafa woredas public administration**.**

The researcher findings was contradicted with the findings of Mengistu (2016), who found that there are technological such as timely update of new version technologies and organizational challenges management relating challenges like as lack of management support in the private organizations in his found. This research result is also indicated that technological challenges are the main challenges hinder ICT adoptions. Kumlachew (2015) also concluded that to adopt and implement new technology, resistant to change, lack of budget, lack of skilled worker and lack of technical supporting services are very influential challenges in order of priorities. Other inhibitors include lack of strategic perspective and government support that influence firm's technology adoption and implementation and controvert with the Meseret (2010), found, that the main challenges that hinder the adoption of ICT in the banking, were a group of environmental related challenges like as inadequacy of the ICT policy. The researcher found that there were the ICT development related challenges in the organizations.

The infrastructure problems were one of the main challenges in adoption of ICT in the two public administrations. The problem of infrastructure can be described in different ways. Firstly, the infrastructure problem was faced in the employee's offices and ICT room. There is the scarcity of the ICT resources like computers and room. As a result, ICT room cannot

handle a large number of employees at the same time and place. Thirdly, the thin clients that found in the ICT adoption ICT room cannot handle removable devices like flash, CDROM, external hard disk.

The other main challenge was the lack of training facility. One of the shortages of facility which existed in the public administrations lab with enough computers and good trainer. Lack of management on controlling the improvement on the usage of ICT and there were inadequate funds on technical supports like fulfilling the room with enough computers and preparing maintenance. Those conditions creates problem on the staffs like inattention of the ICT adoption.

4.5.3. Respondents' Opinion on factors that drives ICT adoption

Factors that drive the ICT adoption were assessed through: - high, medium, and low level. The result replied that the driver in group was relating with the technological relating driver's likes as, link internal and external organizations , launch new information from different directions , speed up organizations process , manager ICT awareness, government support and initiative and organizations trends

Secondly the environmental based driver is the most drivers identified by the respondents of the public administrations like as citizen's pressure or participations. In addition the public administrations would need the group strategy development based drivers such as organizations need to expand the organizations geography, scope of the organizations, speed up the quality services delivery, need to improve the organizations performances, organizations image considerations, to centralized the managements and the need of top management support are the main group of factor related with the strategy design.

Mostly, as the research found that the most factors which were used to drive the ICT to the public administrations were, CT awareness of managers, need of improve organizations performances, organizations image consideration, to speed up the organizations process, availability of infrastructure in the organizations, government support and initiative and improve quality service delivery are the major factors that were drives ICT to the public administrations.

This research in line with the finding(Kumlachew 2014) and Mengistu (2016) are identified the above lists as factors affecting ICT adoption in private organizations and found that

technological based driver are the most driver forces Meseret (2010), study also indicated corporate strategies is the major factor which would be drive the ICT adoption among the organization, my found said that organizations strategies is the major factors drive the ICT adoption, but this research finding contradicted with the findings of Meseret (2010), study also indicated corporate strategies is the major factor which would be drive the ICT adoption among the organization, my found said that organizations strategies is the major factors drive the ICT adoption,, however this research indicated that technological based drivers are the major drivers ICT to the public administrations.

4.5.4. Influences of ICT Adoption in the study areas

The influences of ICT were measured from a viewpoint of three influences and each one is given a value: positive, negative and no influence. The outcome shows the major factors with a positive influence are efficiency of administrations. More respondents responded that ICT could contribute positively to improve the administrations process Bereh and Sendafa Woredas public administrations in one way or other through its impact on, strength the employees performances and professional flexibility and adaptability of products, financial report, link internal and external environments ,motivation of staff ,strengthen citizens participations, strengthen local administrations, improve data quality, multichannel information.

In divergence to the above result there were also respondents who perceive ICT has negative influence and no influence Few also did not know some of influences of ICT(see table 4.9). Influence of ICT has not been yet utilized fully around in the sectors. The need for training on ICT is still very important since the results include some of staff related factors under no influence. The result was more related with Meseret(2010) finding , according to his finding ICT have positive impact on the most organizations attributes like influence are efficiency of occupational processes, quality of client service, my result support this finding.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1. Introduction

Given the problems identified in relation to ICT adoption in Bereh and Sendafa Woredas in public administrations, the perception of the respondents of ICT as the ideal solution is vast. This is evidenced in the potential benefits the respondents expect from ICT among which are improvements in administrations through accuracy, speed, and timely preparation and submission of returns. However the ease of use of ICT in public administration is hindered by multiple challenges. This last chapter of this document is about summarization includes three major topics: conclusion, limitation of the study and recommendation.

5.2. Conclusion

The main objective of applying ICTs in the public administration is to, strengthens the local administrations and increase citizens' participations, access information from multichannel, increases the employees' performances and professional and make as the citizens trust to governments. However the usage of the ICT is limited by the way of system placement, availability and employee skill. This may be Bereh and Sendafa Woredas directly assigned staffs to operate the systems, where as they do no send their staff for training first in order to avoid reluctance of personnel to use ICT.

The study found that more respondents out of do not have basic computers skill i.e they cannot able to scan their computer, cannot operate the computer connect to other computers, cannot browse the internet for administrative purposes, edit the documents and able to accessing the computer in their work place .This may be because of the government did not gave the short term training for the top managements and top management did not give attention to train the organizations personnel about the ICT and enforce as the employees implement this technology in their work place .

All in all, the result show that most respondents do not have basic computer skill and others ICT relating skill for the administrative purpose that is ICT implementation level of Bereh and Sendafa woredas is very week.

The meager challenges of ICT adoption to adopt ICT in Bereh and Sendafa Woredas public administrations were a group of standard ICT developments related challenges such as, problem or scarcity of ICT resources and infrastructures, problems in internet connectivity. The study further found that lack of adequate ICT infrastructure has hampered running of efficient and reasonable ICT services in public administrations in oromia special zone in Bereh and Sendafa woredas in oromia. These challenges may be happen the woreda governments not put more emphasis on delivery of support infrastructure, such as, connectivity, supporting software development and assembly of ICT equipment and accessories and provision of incentives for the provision of ICT infrastructure in major woredas and developed the internet access website by the user localized languages.

Moreover organizational related challenges like lack of management support, lack of training and training facilities and inadequate funds were the main challenges that holdback the administrations to adopt ICT investments. This may possibly take place in order to facilitate the successful implementation of ICT system in Woredas, the government should not provide the employees with computer education and training courses and assign the sufficient budget for the ICT investments as well as gave awareness for the top managements.

In reasonably to the driver for the ICT adoption in the public sectors a group of technological based drives, environmental and developing ICT related strategies in the organizations. But from the individual result of the valid respondents responded that mostly , manager ICT awareness ,need of improve organizations process and performances ,government supportive and initiative ,availability of ICT infrastructure in the organizations ,organizations image considerations and need of link internal and external organizations as well as improve organizations service delivery are the main force which would pull toward ICT to the public administrations. This may perhaps that the ICT knowledge of managers, availability of cost and attitude of the employees with the governmental supporting would be enforce the ICT adoption among the public administrations to stand at front of the challenges.

The influences of ICT were assessed from a viewpoint of three influences and each one is given a value: positive, negative and no influence. Majority of the respondents was consider ICTs role as positive influences for administration, strength the employees performances and professional, flexibility and adaptability of new products and services, on financial report, to link internal and external administrations, to access multichannel information about administrations are the main impact of ICT among public administrations. According to the result, it seems the positive influence of ICT has been known by staff since the results include most of staff related factors influence. This may be the staff have the knowledge of impact of ICT but, they did not have access of ICT resources and sufficient training or education about the new ICT.

5.3. Challenges and limitation of the study

As the study is cross-sectional in design, the possibility of recall biases resulting in under or over reporting and misreporting of events was likely. In addition, most of the information was questionnaire-based; so, questions that required a good memory were vulnerable to recall bias. In spite of the researcher's efforts to gather the necessary information as objective as possible, the analysis of this study was based on the opinion of respondents, so, the respondents may not cooperate well to fill and gave all the necessary data. This may in turn limit the ability to make broader generalization from the study undergone.

5.4. Recommendations

The administrative offices should increase the ICT budget to address adoption challenges in public administrations. Adequate ICT budget should be provided to empowerment the operations of ministry of information and communication as well as the public administrations with a focus of bringing down the cost of ICT adoption.

Adoption of Internet connectivity in the public administrations assures the empowerment and resource sharing among the administrations and link with the other administrations. So establishment of standard local and wide area networks, wireless systems such as VSAT (Very Small Aperture Terminal) and wire DSL (digital subscriber line) should reconsider. This should be done through use of strong and effective servers that are able to transfer data at high speed or use of the recently launched internet through the use of twist pair connection for improving the connectivity efficiency.

Based on the findings, this research recommends that public administrations top managements of Bereh Woreda and Sendafa woreda should train their employees on investments of ICT. This will confirm the staff and functionality of information and communication technology and will also serve to reduce challenges that hinder ICT adoption.

5.6. Suggestions for Further Studies

This study focused on the challenges that holdback ICT adoption and factors that drive adoption of ICT in public administrations in special zone surround finfinne, this research recommends that future research should look into factors that may influence adoption of information and communication technology public administrations in special zone surround finfinne develop the model of ICT adoption.

This study also recommends that multiple qualitative and quantitative surveys to involve more public administration in oromia special zone woredas, in the study to further improve the generalizability of the findings can also be conducted. Through contrasting the responses received from large number of woredas, the ICT adoption situation can be explored more fully and new insights into the information systems adoption practices can be acquired.

Therefore the researcher recommends future studies concerning the development of technology that focus on longitudinal approach would be also valuable to study ICT adoption of Bereh and Sendafa Woredas over time and determine influential factors for other similar public administrations.

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English Version questionnaires

Questionnaire

Dear Sir/ Madam,

Questionnaires on, Adoption of Information and Communication Technology in the Public Administration in Oromia Region: The Case of Bereh Woreda and Sendafa Town.

Dear Respondents'

I am Girma Asefa, a postgraduate student. Currently, I am attending Master of Science in school of Information Science at Addis Ababa University, Ethiopia.

As part of my accomplishment for the program, my research topic lies on your public Administrations. Therefore, this is to kindly ask you to participate in the survey that needs data from your Organizations to assess the issues in relation to the research objective.

This survey is anonymous. No one, including the researcher, will associate your responses with your identity. Your participation is voluntary. You may choose not to take the survey, to stop responding at any time, or to skip any question that you do not want to answer. To increase your understandability the Question for both interview and questionnaire translate to **Afan Oromo** language from English language by Afan Oromo expert/qualified. Your response is extremely important and valuable for the success of the research to achieve the objective of the study by indicating possible gaps, if any, and possible solutions that need to be taken by concerned parties.

Therefore, I appreciate if you spend few minutes from your valuable time according to the instruction for each part.

If you require any assistance or clarification, please don't hesitate to contact me through either of the following methods. Mobile:-**0921132232/0933002084** or Email: **girmafourall@gmail.com**

Thank you for your willingness to participate in this study.

Section 1: Respondents profile

101. Your organization, Please Underline One :(***Woreda, Town***)

102. Which Sector you work? (_____)

103. What is your work responsibility in that sector? _____

104. State your overall work experience.

A. Less 5 years
B. 5 to 10 years
C. 11 to 20 years
D. Above 20

105. State your work experience at this public organization

A. Less than 5 years
B. 5 to 10 years
C. 11 to 20 years
D. Over 20 years

106. Your Gender:

Male ◇ Female ◇

107. Which of the following categories best describes your age?

A. Bellow 20
B. 20 to 40
C. 41 to 60
D. 61 -80
E. Above 80

108. Your Educational level.

A. Diploma
B. Degree
E. TVET level
C. Master's Degree.
D. PHD Degrees

Section 2: ICT related skills

201. Do you have computer from your offices? Yes ◇ No ◇

202. Do you have an e-mail address? Yes ◇ No ◇

203. Do you use computer connected to Internet? Yes ◇ No ◇

2031. If your response to question number 203 is „yes", where do you use computer? Please Tick "√"in the box that describes your viewpoint.

place	Tick
Home	◇
ICT lab	◇
Office	◇
Internet café/ center	◇

Other Please specify _____

204. Please read the items in the table below and put a „√ " in the box that best describes your Computer related skills.

Descriptions of Usage of Computer	No	yes
Using virus scanner software of computer	◇	◇
Using printer that connect to the computer	◇	◇
Browse internet for administrative purpose	◇	◇
communicate through email by sending and receive message	◇	◇
Using excel to analysis data	◇	◇
Using Word processing to type document	◇	◇

Other please specify _____

Section 3: Challenges of ICT

301. What are the Challenges for implementing ICT applications in your public organizations? Explain your idea using yes or no

Challenges	Yes	No	Don't know
Scarcity of ICT resources and infrastructure in the sectors	◇	◇	◇
Problems in internet connectivity and bandwidth issue (low)	◇	◇	◇
Lack of confidence in using computers of employees	◇	◇	◇
Lack of owner/vendor	◇	◇	◇
Lack of awareness to change management	◇	◇	◇
Lack of citizen encouragement	◇	◇	◇
Lack of training facilities	◇	◇	◇
Lack Management support	◇	◇	◇
Lack of government encouragement	◇	◇	◇
Inadequate funds in the organizations	◇	◇	◇
Problem in strategies development	◇	◇	◇
New version of existing software	◇	◇	◇
Fear of employees on personal values	◇	◇	◇
ICT device and applications are too expensive	◇	◇	◇
Lack of localization- languages user interface	◇	◇	◇

Others please Specify: _____

Section 4: Respondents Opinion on factors that drives ICT adoption

401. Indicate your level of agreement using a scale of 1-5, on the following factors affecting ICT adoption, where (**5**= I don't know, 4= none, 3= low **2**=medium, 1=high).tick by using "√".

Factor that drive ICT adoption	Ranks				
	1	**2**	**3**	**4**	**5**
Improved quality service delivery	◇	◇	◇	◇	◇
Expand organization geography	◇	◇	◇	◇	◇
Improve organizations performances	◇	◇	◇	◇	◇
organization image considerations	◇	◇	◇	◇	◇
Organization scope	◇	◇	◇	◇	◇
Top management support	◇	◇	◇	◇	◇
manager innovativeness	◇	◇	◇	◇	◇
manager ICT awareness	◇	◇	◇	◇	◇
Citizen's pressure	◇	◇	◇	◇	◇
Organization trends	◇	◇	◇	◇	◇
government support and initiative	◇	◇	◇	◇	◇
speed up organization processes	◇	◇	◇	◇	◇
link internal and external organizations	◇	◇	◇	◇	◇
Employees attitudes	◇	◇	◇	◇	◇
Availability of ICT infrastructure	◇	◇	◇	◇	◇
Launch new information	◇	◇	◇	◇	◇

Others, please Specify: _____

Section 5:-Influence of ICT

501. Please specify, if ICT has any influence or no influence at all in the following areas, Tick by using "√".

Influences of ICT	Influence			
	Positive	Negative	No influence	Don't Know
Flexibility and adaptability of product	◇	◇	◇	◇
Reduction of performance cost	◇	◇	◇	◇
Motivation of staff	◇	◇	◇	◇
Data quality	◇	◇	◇	◇
Multichannel information	◇	◇	◇	◇
Trust to government	◇	◇	◇	◇
Financial report	◇	◇	◇	◇
Strength the local administrations	◇	◇	◇	◇
Strength the citizens participations	◇	◇	◇	◇
Link internal and external organizations	◇	◇	◇	◇
Strength the employees performances and professional	◇	◇	◇	◇

Others please specify: - _____

English Version Interview questions

Interviewer profile

Name:-_____

Sex :(male, female)

Position /title:_____

Work experience serves (year)_____

Hardware related interviews

- Is there server computer in your organizations? if yes how many?
- How many computers in your sector?
- Is there switch in your sector? If yes how many?
- Is there hub in your sector? If yes how many?
- Is there router in your organizations? If yes how many?

Software related interviews

1. What software you use to property management system?
2. What software document sharing?
3. Do you use enterprise resource planning system?

Internet Service relating interviews

1. What internet services you use? (Fixed and wireless).

Network relating interviews

1. What network types you implements? (LAN, MAN and WAN)?

Observation check list

1. How users using Internet services in offices.
2. The available infrastructures - both hardware and software – and how fast documents can be accessed from the Internet and how fast pages opened on the users' browsers.
3. How technical support is given to the users in the offices?
4. What challenges that exist in those offices?
5. What are the available ICT tools in the institutions?
6. How the Employees perform in their offices?

Gaaffii gaafillee Oddeeffaannoo Funaanuf Qopha'e

Kabajamoo ,deebi deebistootaa!

Qorrannoon kan Adeemsisamuu haala.

"*Adoption of Information and communication Technology in public administration in oromia: The case of Bereh and Sendafa Woredas*"

Gaafilleen kun haala hojjetootni bulchiisni mootummaa naannoo Oromiyaa kan Waradaa Barakki fi sandafaa ilaalchisee technolojii qunnamtii ammayaa akkamitti akka gara ofiittii fudhachuun haala hojiisaan ittin adeemsisan, qorannoo taasisuuf kan qopha'eedha. Gaaffileen kun qorannoon ani taasissuf kan nagargaru yoo ta'u gutumaan guututi qorannoo qofaanf kan oluudha. Kanaafuu gaaffilee armaan gaditti dhiayaatan kana deebii dhugaa ta'e akka nuuf kenitaniif kabajaan isin gaafachaa, deebiin keessan kam'iyuu icitidhaan kan qabamu ta'uu isaa misrkaneesuun barbaada.

Yeroo gaaffillee kan deebistan yoo rakkoon jiraatee qorataa waliin karaa toora moobayilaa fi E-mail armaan gadiitin.

Moobiyala: 0921132232/0933002084

Email :girmafourall@gmail.com

Afan Oromo version questionnaires

Kutaa 1:- Oddeeffannoo Gaaffii Deebistootaa

101. Dhaabbata kam keessa hojjetaa? Tokko jala muri (Aanaa ,Magaala).

102 . Waajjira kam hojjetaa? (_____).

103. Wajjira kana keessatti gaheen hojjii kee maalidha?(_____).

104. Muuxannoo hojii kee kan walii gala waggaa meeqaa?

A. Waggaa 5 gadi

B. Waggaa 5 hanga 10

C. Waggaa 11 hanga 20

D. Waggaa 20 ol

105. Dhaabbata kana keessaa erga hojjii eegaltee hagam?

A. Waggaa 5 gadi

B. Waggaa 5 hanga 10

C. Waggaa 11 hanga 20

D. Waggaa 20 ol

106. Saalan maalidha ati? Dhiira ◇ dhalaa ◇

107. Umriin kee kam keessatti Ramadamaa?

A. Waggaa 20 gadi

B. Waggaa 20 hanga 40

C. Waggaa 41 hanga 60

D. Waggaa 60 oli

108. Sadarkaan barumsaa kee kam keessati ramadamaa?

A.Dipiloomaa

B. Digirii

C. Mastarsii

D. Doktoreetiidha

E. TVE

Kutaa 2:Hojimaata ICT (ICT related skill)

201 . Ati compiyutara dhunfatti Biiroo Keeti qabdaa? Eeyyee ◇ Lakkii ◇

202. Ati "E-mail" qabdaa? Eeyyee ◇ Lakkii ◇

203. Koompiyutara ati itti fayyaadamtuu intarneettii qaba. Eeyyee ◇ Lakkii ◇

2043. Lakkoofsa 203f deebin kee "Eeyyee" yoo ta'e yeroo baay'ee eessatti fayyadamtaa?

Qajjeelfama:- saanduqa kaa'ame san keessaatti mallattoo"√" kaa'uudhaan waa'ee itti fayyadama intarneeta eessaati akka fayyadamtuu yaada kee tokkoo fi isaa ol lafa ka'uu ni dandeessa.

Iddoo	◇
Manatti	◇
Waajjira ICT tti	◇
Birootti	◇
Wirtuu intarneetii kaaffeettii	◇

Iddoo Biroo_____

205. Faayidaalee compiyutaraa armaan gadiitti ibsaman keessaa isa kam akka salphaati argachuu fi itti fayyadamuu dandeessaa ykn itti fayadamtaa? Mallattoo "√" ka'uudhan yaada kee kennuu ni dandeessa.

Faayidaawwaan kompiyutaraa kan bu'uuraa	**Yes**	**No**
Vaayirasii Iskanarrii software fayyaadamuu	◇	◇
Document print gochuu	◇	◇
Database access jedhamu fayyadamuu	◇	◇
MS-excel fayyadamuun data qaacessuu	◇	◇
Word processor fayyadamuun Dokumantiwwaan edit godhuu	◇	◇
E.mail dhimmaa hojiif arguu fi fudhachuu	◇	◇
Dhimmaa bulchiisaf Intarneeta fayyaadamuu	◇	◇

*Kan biroo kan beektu yoo jiraate tareessii?*____ _____

Kutaa3: **Sababoota gurguddoo ICT Fudhachuurrattii dhiibbaa Uuman**

301**.** Lakkoofsa 5-1 akka Iskeelittii fayyadamuun hamma itti amante agarsiisi.

Yaadannoo: **5**= olaanaa ,**4**=jiddugala,**3**=gad-aanaa ,**2**=homaa,**1**=hin beeku

Sababoota akkaa ICT fudhatan godhan	**1**	**2**	**3**	**4**	**5**
Jijjiramaa fi fudhannaa Omishaalee	◇	◇	◇	◇	◇
dhabbata ji'oograaffii isaa babaldhisuun	◇	◇	◇	◇	◇
Hojii dhabbataa foyyeessuuf	◇	◇	◇	◇	◇
Muldhata dhabbatni qabu	◇	◇	◇	◇	◇
Dhangaa dhabbatni qabu	◇	◇	◇	◇	◇
Bulchiinsa jidduu galeesssaa uumuf	◇	◇	◇	◇	◇
Gargaarsa bulchiinsa ol-aanaan godhuu	◇	◇	◇	◇	◇
Bulchiinsi waan haaraa uumuf kakka'umsa inni godhu	◇	◇	◇	◇	◇
Buldhinsin hubbannaa inni ICT irrati qabu	◇	◇	◇	◇	◇
Sochi dhabbatni guddina jiddu galeessaa fiduuf godhu	◇	◇	◇	◇	◇
Gargaarsa mootummaan dhabbataaf qodhu	◇	◇	◇	◇	◇
Hojii dhabbaataa saffisiisuf	◇	◇	◇	◇	◇
Dhabbatoota gara garaa wal qunnamsiisuf	◇	◇	◇	◇	◇
Hubbannaa hojettotni beekumsa walii qoodurrati qaban	◇	◇	◇	◇	◇
Jiraachuu meeshalee ICT dhabbatni qabu	◇	◇	◇	◇	◇
Oddeeffannoo kallatillee gara garaarraa argachuu	◇	◇	◇	◇	◇

Kan biroo yoo jiraate mee ibsaa_____

Kutaa 4: Taateewwan ICT

401. Kan armaan gadittii gabatee keessatti tarreeffaman irraatti ICTn taatee maalii raawwataa? ***Yaadannoo***: **4**= taate poozativaa,**3**=taate Nagativaa,**2**=Taatee homaa hin rawwatu,**1**=hin beeku

Taateewwan	1	2	3	4
Jijjiramaa fi fudhannaa Omishaalee oomishaa	◇	◇	◇	◇
Mallaqa hojii hojjetamuu hir'isuu	◇	◇	◇	◇
Kaka'umsa hojjetootaa	◇	◇	◇	◇
Qulqullina deetaa	◇	◇	◇	◇
Odeeffannoo kallattii garagaraa	◇	◇	◇	◇
Mootummaatti Amanuu	◇	◇	◇	◇
Gabaasa faaynaansii	◇	◇	◇	◇
Dameewwaan seeraa	◇	◇	◇	◇
Bulchiinsa naannoo cimsuu	◇	◇	◇	◇
Hirmaannaa lammiilee cimsuu	◇	◇	◇	◇
Dhabbatoota gara garaa wal qunnamsiisuu	◇	◇	◇	◇
Haala hojii hojjetamuu cimsuu fi oggummaa hojetootaa guddsisuu	◇	◇	◇	◇

Kan biroo yoo jiraate mee ibsi:_____

Kutaa 5: Hojiiwwaan Ulfaatoo dandeetin ICT Ittiin qoratamu

501. Wantootni ulfaaton dandeettii namaa madaalun akka hojjettootni meeshaalee ICT seeran hin fayyadamne gufuu ta'an maal faadha akka dhabbata keeti?

Yaadannoo: **1**=Eeyyee ,**2**=miti ,**3**= hin beeku', ta'e

Gufuuwwaan gurguddoo	**3**	**2**	**1**
Meeshaaleen ICT gahaa ta'uu dhiisuu	◇	◇	◇
"Network" gad-aanaa waan ta'eef/waan cicciituuf	◇	◇	◇
Hojjettootni ofitti amantummaa gahaa dhabuu	◇	◇	◇
Abban qabeenyaa meeshalee dhiyeessu dhabamuu	◇	◇	◇
Jajjabeessi gara lammilleen dhabamuu	◇	◇	◇
Leenjii/barumsa oggummaa meeshaalee kanaa dhabuu	◇	◇	◇
Gargaarsi gara bulchiinsan dhabamuu	◇	◇	◇
Gargaarsi gara mootummaan dhabamuu	◇	◇	◇
Dhaabbanni mallaaqa gahaa dhabuu	◇	◇	◇
Rakkina imaammata dhaabbataa	◇	◇	◇
"Softwar" yeroo yeroon "update" ta'uu	◇	◇	◇
Sodaa hojjeettootni bu'aa bu'uura irratti qaban	◇	◇	◇
Gatiin meeshalee kanneenii mi'aa ta'uu	◇	◇	◇
Sodaa hojjetootni bu'aa bu'uura irrati qaban	◇	◇	◇
Rakkinoota Afaani fi adawwaan tokko tokkoo	◇	◇	◇

Kan biraa yoo jiraate mee ibsi:_____

Afan Oromo Version Interviews

Oddeeffannoowwaan deebi deebistootaa

Maqaa:-_____

Saala :(dhiira, dhalaa)

Gita hojii:_____

Muuxxannoo hojii_____

Gaafiwwaan Afaan Hardware Wal-qabate

1. Konpiyutara "server" jedhamu qabdu? Eeyyee yoo ta'e meeqa?
2. Kompiyutaroota meeqa qabduu?
3. Switch" qabduu ? eeyyee yoo ta'e meeqa bayyinni isaani? "
4. "Hub" qabduu ? eeyyee yoo ta'e meeqa bayyinni isaani?
5. "Router" qabduu ?

Gaafiwwan software walqabate

1. Meeshalee to'achuuf software kami fayyadamtuu?
2. Dokumantii sharii godhuuf software kam fayyadamtuu?
3. What software p property Management System?
4. Enterprise resource planning ni fayyadamtuu?

Internet Service relating interviews

1. Gosa internetaa kam fayyadamtaa? (Fixed and wireless).

Network relating interviews

1. Gosa networkii kam implementii gootuu?(LAN,MAN and WAN)?